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Three bibliographies, each of which is divided into two parts, provide information on reading in the content areas of mathematics, science, and social studies. The first part contains abstracts of documents selected from six ERIC/CRIER basic references. The second part lists annotated materials from a seventh reference in order to provide some access to literature on the topic prior to 1950. Entries are arranged alphabetically according to author, and each bibliography contains an author index. A complete description of the seven ERIC/CRIER basic references and the availability of the documents within each reference are given. (WB)

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Research on Reading in the Content Fields: Mathematics, Science, and Social Studies

Compiled by
James L. Laffey
Indiana University

RE 001 484

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ERIC/CRIER READING REVIEW SERIES

Volume 2 Bibliography 10

Research on Reading in the Content Fields: Mathematics, Science, and Social Studies

Compiled by
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U. S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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July, 1968

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Research on Reading in the Content Fields: Mathematics, Science, and Social Studies contains three bibliographies, each of which is divided into two parts. The first part contains documents selected from six ERIC/CRIER basic references. The second part lists materials from a seventh ERIC/CRIER basic reference in order to provide some access to the literature on the topic prior to 1950. In addition, each bibliography contains an author index. A complete description of the seven ERIC/CRIER basic references and the availability of the documents within each reference follows.

ERIC/CRIER BASIC REFERENCE NUMBER 1

Published Research Literature in Reading, 1950-1963, (ED 012 834)

Presents 1,913 citations and annotations on published research literature in reading taken from the annual summaries of investigations in reading compiled on a yearly basis by the Reading Research Center of the University of Chicago. The citations from the annual summaries for 1950-1963 were transferred to magnetic tape which was used to generate a special master for multilithing the publication. Complete bibliographic data for the journal sources used to compile the listing are given. The entries are arranged alphabetically by author in yearly segments. The bibliography covers the complete reading spectrum from preschool to college and adult years and presents research on all aspects of reading, including physiology, psychology, sociology, and teaching of reading. Complete information on the development of the bibliography is included.

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The documents reported from this reference have appeared in the published journal literature for the most part and are available in libraries with good journal collections. The documents included from this reference will usually approximate the form of the following samples when they appear in the bibliographies.

4367
Belden, Bernard R. "Utilization of Readability Formulas for Effective Instruction," _Problems, Programs and Projects in College-Adult Reading_ (edited by Emery P. Bliesmer and Ralph C. Staiger), Eleventh Yearbook of the National Reading Conference, (1962), 139-47.

2992
Bergen, Catharine. "The Prevalence of Mathematics in Science from 1900 to 1950," _School Science and Mathematics_, LI (June, 1951), 443-46.

4291
Martin, Mavis, and Lee, Wayne. "Sample Frequency in Application of Dale-Chall Readability Formula," _Educational Research Bulletin_, 40 (September, 1961), 146-49.

Note that a four digit number precedes each of the above document citations. This is the ERIC/CRIER identification number for that document. This number can also serve to identify documents from this reference. Documents from _Published Research Literature in Reading, 1950-1963_ will have numbers from 2885 to 4803 inclusive.

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ERIC/CRIER BASIC REFERENCE NUMBER 2

Published Research Literature in Reading, 1964-1966, (ED 013 969)

Presents 849 citations and annotations on published research literature in reading taken from the annual summaries of investigations in reading compiled on a yearly basis by the Reading Research Center of the University of Chicago. The citations from the annual summaries for 1964-1966 were transferred to magnetic tape which was used to generate a special master for multilithing the publication. Complete bibliographic data for the journal sources used to compile the listing are given. The entries are arranged alphabetically by author in yearly segments. The bibliography covers the complete reading spectrum from preschool to college and adult years and presents research on all aspects of reading, including physiology, psychology, sociology, and the teaching of reading. Complete information on the development of the bibliography is included.

This reference can be purchased from the ERIC Document Reproduction Service in microfiche and hard copy format. (Microfiche $0.75 and hard copy $7.28). The ED number listed above *must* be used in ordering the reference.

The documents reported from this reference have appeared in the published journal literature and are available in libraries which have good journal collections. The documents selected from this reference will usually approximate the form of the following samples when they appear in the bibliographies.

6269
Barrilleaux, L. E. "An Experiment on the Effects of Multiple Library Sources as Compared to the Use of a Basic Textbook in Junior High School Science," *Journal of Experimental Education*, 35 (Spring 1967), 27-35.

6273
Bennett, L. M. and Clodfelter, Cherie. "A Study of the Integration of an Earth Science Unit Within the Reading Program of a Second Grade by Utilizing the Word Analysis Approach," *School Science and Mathematics*, 66 (1966), 729-36.

6367
Hollenbeck, G. P. "Predicting High School Biology Achievement with the Differential Aptitude Tests and the Davis Reading Test," *Educational and Psychological Measurement*, 27 (1967), 439-42.

Note that a four digit number precedes each of the above document citations. This is the ERIC/CRIER identification number for that document. This number can also serve to identify documents from this reference. Documents from _Published Research Literature in Reading, 1964-1966_ will have numbers from 4804 to 5345 inclusive for the years 1964-1966 and numbers from 6253 to 6562 inclusive for the year 1966-1967.

ERIC/CRIER BASIC REFERENCE NUMBER 3

USOE Sponsored Research on Reading, (ED 011 603)

Provides a listing of important research completed on reading and closely related topics. Relevant issues of _Research in Education_, and _Office of Education Research Reports, 1956-65_ were reviewed and documents which discussed research on reading and allied topics selected for inclusion. The bibliography provides a comprehensive review of all USOE projects on reading funded by the Bureau of Research since its inception in 1956. Each entry includes citation data, index terms, and a descriptive abstract of the contents of the document. All documents are available from EDRS/NCR. Complete information on microfiche and hard copy prices is included with each document along with the ED number necessary for ordering the document.

This reference can be purchased from the ERIC Document Reproduction Service in microfiche or hard copy format. (Microfiche $0.50 and hard copy $4.24). The ED number listed above _must_ be used in ordering this reference.

The documents reported from this reference have been taken from a more extensive collection reporting USOE sponsored research in all areas of education.* All documents listed from this reference can be ordered in microfiche or hard copy format using the ED number and prices given with each document. They can be ordered from the ERIC Document Reproduction Service at the address listed previously. The documents included from this reference will usually approximate the form of the following samples when they appear in the bibliographies.

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*The complete collection is titled: _Office of Education Research Reports, 1956-65, Indexes_ (OE-12028) $2.00, and _Office of Education Research Reports, 1956-65, Resumes_ (OE-12029) $1.75. Both can be ordered by sending a check or money order to: Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

6610
A Comparative Study of Beginning Reading Achievement Under Three Classroom Organizational Patterns--Modified Individualized, Three-to-Five Groups, and Whole-Class Language-Experience.
By: Marita, Sister M.
Marquette Univ., Milwaukee, Wis.
Report Number CRD-2659
Contract OEC-4-10-263
ED 003 477 EDRS Price MF-$0.50 HC-$3.16 79P.

6611
Reading Achievement in Relation to Growth in Perception of Word Elements in Three Types of Beginning Reading Instruction.
By: Murphy, Helen A.
Boston Univ., Mass.
Report Number CRD-2675 Pub Date: 65
ED 003 478 EDRS Price MF-$0.50 HC-$4.56 114P.

6619
A Study of the Effects of Self-Directive Dramatization on the Progress in Reading Achievement and Self-Concept of the Culturally Disadvantaged Elementary School Children.
By: Carlton, Lessie & Moore, Robert H.
Illinois State Univ., Normal
Report Number CRD-S-190
ED 003 692 EDRS Price MF-$0.50 HC-$3.32 83P.

Note that a four digit number precedes each of the above document citations. This is the ERIC/CRIER identification number for that document. This number can also serve to identify documents from this reference. Documents from USOE Sponsored Research on Reading will have numbers from 6563 to 6706 inclusive.

ERIC/CRIER BASIC REFERENCE NUMBER 4

Recent Doctoral Dissertation Research in Reading, (ED 012 693)

Lists dissertations completed in colleges and universities since 1960 in the areas of preschool, elementary, secondary, college, and adult reading. Relevant issues of Dissertation Abstracts were reviewed, and dissertations on reading were noted. A comprehensive analytical abstract was prepared by a professional in reading who worked from the summary reported for each dissertation. In many instances the dissertation itself was reviewed in preparing the abstract. As much as possible of the procedures, design, and conclusions of each investigation was included in the abstract. Each entry includes complete bibliographic data. Three hundred seventy-nine theses are listed alphabetically by the author's last name.

This reference can be purchased from the ERIC Document Reproduction Service in microfiche or hard copy format. (Microfiche $2.00 and hard copy $8.84). The ED number listed above must be used in ordering the reference.

Copies of the documents reported from this reference can be ordered from University Microfilms, Ann Arbor, Michigan in positive microfilm or hardbound xerographic form. Complete information for ordering documents is included with each reference. The documents included from this reference will usually approximate the form of the following samples when they appear in the bibliographies.*

5505
Howards, Melvin. "Measuring Children's Understanding of Selected Multiple-Meaning Words as it Relates to Scientific Word Lists," Ph.D., New York University, 1963. Vol. XXVI, No. 2, 905-906. (Order No. 63-6665, Microfilm $3.00; Xerography $5.40, 107 pages.)

5513
Jacobson, Milton Durwood. "Reading Difficulty of Physics and Chemistry Textbooks in Use in Minnesota," Ph.D., University of Minnesota, 1961. Advisers: Clarence H. Boeck, Raymond O. Collier, XXII, No. 11, 3950-51. (Order No. 62-1790, Microfilm $2.85; Xerography $9.90, 218 pages.)

5530
Koester, Paul William. "Reading Science Materials for Two Specific Purposes at the Sixth Grade Level," Ed.D., University of Illinois, 1961. XXI, No. 12, 3717. (L.C. Card No. Mic 61-1631, Microfilm $2.90; Xerography $10.15, 223 pages.)

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*Another compilation of doctoral research related to reading listing theses completed from 1900 to 1960 is also available. The document is available through EDRS. The complete citation and ED number are as follows: Doctoral Studies in Reading, 1900-1960 (Microfiche $0.50, hard copy $3.60) (ED 011 486)

Note that a four digit number precedes each of the above document citations. This is the ERIC/CRIER identification number for that document. This number can also serve to identify documents from this reference. Documents from Recent Doctoral Dissertation Research in Reading will have numbers from 5348 to 5727 inclusive.

ERIC/CRIER BASIC REFERENCE NUMBER 5

International Reading Association Conference Proceedings Reports on Elementary Reading, (ED 013 197)

Lists the important papers published in the yearly conference proceedings of the International Reading Association in Elementary Reading since 1960. The complete text of each paper is provided. The 345 papers are presented within the following categories--(1) The Objectives and Goals in Reading, (2) Reading Programs, (3) Teacher Education, (4) Reading Materials, (5) Methods and Grouping, (6) Reading Skills, (7) Early Reading Instruction, (8) Pre-School Reading, (9) Reading Readiness, (10) Reading in the Content Areas, (11) Reading and the Bilingual Child, (12) First-Grade Reading, (13) Linguistics and Reading Instruction, (14) Reading and the Disadvantaged, (15) Reading in Other Countries, and (16) The Diagnosis and Treatment of Reading Difficulty. This bibliography should be useful to practitioners and researchers interested in elementary reading. An author index is included.

This reference can be purchased in microfiche or hard copy format from the ERIC Document Reproduction Service. (Microfiche $4.25 and hard copy $45.48).

The documents contained in this reference can only be ordered as a complete unit from the ERIC Document Reproduction Service. The ED number listed above must be used in ordering the document collection. The documents included from this reference will usually approximate the form of the following samples when they appear in the bibliographies.

6138
Bamman, Henry A. "Developing Reading Competencies Through Mathematics and Science," Reading as an Intellectual Activity, 8 (1963), 110-112.

6143
Fay, Leo. "Reading Study Skills: Math and Science," Reading and Inquiry, 10 (1965), 92-94.

6152
Larrick, Nancy. "Nature, Science, and Children's Reading," Changing Concepts of Reading Instruction, 6 (1961), 191-93.

Note that a four digit number precedes each of the above document citations. This is the ERIC/CRIER identification number for that document. This number can also serve to identify documents from this reference. Documents from International Reading Association Conference Proceedings Reports on Elementary Reading will have numbers from 5908 to 6252 inclusive.

ERIC/CRIER BASIC REFERENCE NUMBER 6

International Reading Association Conference Proceedings Reports on Secondary Reading, (ED 013 185)

Lists the important papers on junior and senior high school reading published in the yearly conference proceedings of the Association since 1960. The complete text of each paper is provided. The papers are presented within the following categories--(1) Reading Programs, (2) Reading Personnel, (3) Methods and Grouping, (4) Developing Reading Skills, (5) Materials, (6) Reading and Content Areas, (7) Developing Interests and Tastes, (8) Linguistics and the Teaching of Reading, (9) The Library and the Reading Program, (10) Reading and the Bilingual Student, (11) Reading and the Disadvantaged, and (12) The Diagnosis and Treatment of Reading Difficulties. This bibliography should be useful to practitioners and researchers interested in secondary reading. An author index is included.

This reference can be purchased in microfiche or hard copy format from the ERIC Document Reproduction Service. (Microfiche $2.25 and hard copy $23.20).

The documents contained in this reference can only be ordered as a complete unit from EDRS. The ED number listed above must be used in ordering the document collection. The documents included from this reference will usually approximate the form of the following samples when they appear in the bibliographies.

5730
Buehler, Rose Burgess. "Innovations in High School Reading Instruction," Vistas in Reading, 11, Part 1, (1966), 169-71.

5734
Janes, Edith C. "Reading Guidance in Departmentalized Programs," Vistas in Reading, 11, Part 1, (1966), 230-33.

5742
Simpson, Elizabeth A. "Responsibility for Secondary Level Reading Programs," Changing Concepts of Reading Instruction, 6 (1961), 203-206.

Note that a four digit number precedes each of the above document citations. This is the ERIC/CRIER identification number for that document. This number can also serve to identify documents from this reference. Documents from International Reading Association Conference Proceedings Reports on Secondary Reading will have numbers from 5728 to 5907 inclusive.

ERIC/CRIER BASIC REFERENCE NUMBER 7

Published Research Literature in Reading, 1900-1949, (ED 013 970)

Presents 2,883 citations and annotations on published research literature in reading taken from the annual summaries of investigations in reading compiled on a yearly basis by the Reading Research Center of the University of Chicago. The citations from the annual summaries for 1900-1949 were transferred to magnetic tape which was used to generate a special master for multilithing the publication. Complete bibliographic data for the journal sources used to compile the listing are given. The entries are arranged alphabetically by author in yearly segments. The bibliography covers the complete reading spectrum from preschool to college and adult years and presents research on all aspects of reading, including physiology, psychology, sociology, and the teaching of reading. Complete information on the development of the bibliography is included.

This reference can be purchased from the ERIC Document Reproduction Service in microfiche or hard copy format. (Microfiche $2.00 and hard copy $19.92).

The documents reported from this reference have been added as a supplementary section to each of the three bibliographies to aid the researcher interested in earlier research in the three topic areas. The documents in this reference have appeared in the published journal literature and are available in libraries which have good journal collections. The documents from this reference will usually approximate the form of the following samples when they appear in the bibliographies.

> 19
> Beauchamp, Wilbur L. "A Preliminary Experimental Study of Technique in the Mastery of Subject-Matter in Elementary Physical Science," Studies in Secondary Education, I, *Supplementary Educational Monographs*, No. 24. Department of Education, University of Chicago, 1923. pp. 47-87.
>
> 300
> Pollock, C. A. "Children's Interests as a Basis of What to Teach in General Science," *Educational Research Bulletin*, III (January 9, 1924), 3-6.
>
> 2883
> Yoakam, Gerald A. "The Place of Textbooks in Children's Reading," *A Report of the Fourth Annual Conference on Reading, June 28 to July 9, 1948*. Pittsburgh, Pa.: University of Pittsburgh, 1949. pp. 65-75.

Note that a two to four digit number precedes each of the above document citations. This is the ERIC/CRIER identification number for that document. This number can also serve to identify documents from this reference. Documents from *Published Research Literature in Reading, 1900-1949* will have numbers from 2 to 2883 inclusive.

Research on Reading in the Content Fields:
Mathematics

4366
Bauernfeind, Robert H., and Blumenfeld, Warren S. "A Comparison of Achievement Scores of Public-School and Catholic-School Pupils," Educational and Psychological Measurement, 23 (Summer 1963), 331-36.

A study to determine whether or not group differences in educational achievements exist for matched groups of public and Catholic school pupils at the eighth grade level was made in 1959 and again in 1960. The measuring instrument was the Science Research Associates High School Placement Test, 1959 and 1960 editions. The academic areas measured were nonverbal reasoning, arithmetic and reading in 1959. Language arts was added in 1960. In 1959, test records for some 80,000 public school children and 60,000 Catholic school children were available. A sample of 1,000 pupils attending Catholic schools was drawn. A sample of 1,000 public school pupils was drawn to match the Catholic sample. With the two groups matched for general reasoning ability, sex, and geographic region, the Catholic school pupils scored a mean Grade Equivalent approximately 1.0 years higher than the public school pupils on the two criterion achievement tests. Both differences exceeded the .01 level of confidence. In 1960, a national-sampling model was developed, and cases for both groups were selected to conform to this model. The Catholic school pupils scored a mean Grade Equivalent approximately 0.45 years higher than the public school pupils on all three criterion achievement tests. All three differences exceeded the .01 level of confidence. A discussion of the results is given. Tables and references are included.

2992
Bergen, Catherine. "The Prevalence of Mathematics in Science from 1900 to 1950," School Science and Mathematics, LI (June, 1951), 443-46.

Articles from the issues of the Physical Review and the Journal of the American Chemical Society of 1900 and decade years thereafter up to 1950 were analyzed to investigate the claim that chemistry and biology had become increasingly mathematical. It was concluded that although there did not seem to be any steady trend of increase in the use of mathematics in any one science, there were periods in which each science was lifted to a new mathematical level. This occurred in physics and in related areas of physical chemistry with respect to the use of the higher mathematical methods of quantum mechanics in the late 1920's. It occurred in chemistry with respect to mathematics in general during the decade between 1910 and 1920. It had beginnings in biology at about 1940. The significance of these changes was attributed to the attitude of respect toward mathematical science which the instructor passed on to his students and to the insight into the role which mathematical equations played in facilitating scientific discoveries. Tables are included.

3596
Betts, Emmett Albert. "Research on Reading as a Thinking Process," *Journal of Educational Research*, L (September, 1956), 1-15.

Three doctoral dissertations related to critical thinking in reading situations are reviewed: (1) Artley, A. Sterl, *A Study of Certain Relationships Existing Between General Reading Comprehension and Reading Comprehension in Specific Subject Matter Areas*, (2) Maney, Ethel Swain, *Literal and Critical Reading in Science*, and (3) Sochor, E. Elona, *Literal and Critical Reading in Social Studies*. A discussion of some of the implications drawn from the studies is given under the following headings: Basic Reading Instruction, Reading Capacity Tests, Reading Achievement Tests, and Reading Clinics. A 28-item bibliography is included.

6139
Botel, Morton. "The Study Skills in Mathematics," *Reading and Inquiry*, 10 (1965), 89-92.

Explains the close connection between a mathematical sentence expressed in symbols and a life situation expressed in words.

4566
Braam, Leonard S., and Roehm, Marilyn A. "Subject-Area Teachers: Familiarity with Reading Skills," *Journal of Developmental Reading*, 7 (Spring 1964), 188-96.

A questionnaire was distributed to obtain a general picture of classroom teachers' awareness of the skills relevant to successful reading in their subject areas. Fifteen schools in New York state participated. Teachers were asked to list the reading skills most necessary in their areas, the skills students performed best, and the skills most deficient. Teachers responded yes or no to questions regarding teacher training in reading, the presence of a reading program in their schools, and the presence of a reading specialist in their schools. The responses, some of them contradictory, were analyzed. It was concluded that communication between reading experts and classroom teachers was not effectively accomplished through the professional writing and teacher training programs or by the reading specialists employed in the schools. A table and references are given.

5071
Call, R. J., and Wiggin, N. A. "Reading and Mathematics," *Mathematics Teacher*, 59 (1966), 49-57.

The relationship between a student's ability to solve word problems in second year algebra and the presence or absence of special reading instruction was studied. Subjects were students in second year algebra who were divided into experimental and control groups and were matched on IQ, aptitude, and prior achievement. The experimental group received instruction in reading mathematical problems while the control group did not. The experiment ran 10 days. A teacher-made word problem test was administered to both groups. A frequency distribution, means, and standard deviations were used to analyze the data. Provision was made in the data analysis for those students who used the correct procedure but made computational errors. The number of problems correct in the experimental group was 46, while the control group had 12 correct. The number of procedures correct were 69 and 24 for the experimental and control groups respectively. There appeared to be merit in teaching special reading skills for the solution of mathematics problems. Lesson plans and tables are included.

4202
Cleland, Donald L., and Toussaint, Isabella H. "The Interrelationships of Reading, Listening, Arithmetic Computation and Intelligence," Reading Teacher, 15 (January, 1962), 228-31.

The interrelationships among reading, listening, arithmetic computation, and intelligence were studied. One hundred seventy-two students enrolled in nine intermediate classes of two suburban schools of Western Pennsylvania were subjects. There was a slight bias in favor of the superior socioeconomic strata. Intelligence was measured by both the SRA Primary Mental Abilities (PMA), Form AH, and the Stanford-Binet Intelligence Scale, Form LM. Scores from these five group tests and one individual test were obtained for every pupil used: the Gates Reading Survey - Form 2, the Durrell-Sullivan Reading Capacity Test and the Sequential Test of Educational Progress Listening 4A, the American School Achievement, Form G, Part II, and Arithmetic Computation. The first part of the study determined the interrelationships among the selected measures by means of the correlation technique. In the second part, multiple coefficients of correlation were determined by the Doolittle method to determine the optimum weights to be assigned to the best combination of independent predictive variables. The STEP-Listening showed a closer relationship with reading achievement as measured by the Gates Reading Survey than the Durrell-Sullivan. The Stanford-Binet and the PMA showed approximately the same relationship with reading. Other conclusions and implications are given. Tables are included.

6142
Coulter, Myron L. "Changing Concepts of Reading Instruction in the Content Areas in the Intermediate Grades," Changing Concepts of Reading Instruction, 6 (1961), 35-38.

Reviews reasons why reading is important to curriculum and pinpoints concept changes in the areas of arithmetic, science, and social studies.

5089
Coulter, Myron L. "Verbal Problem Solving in the Intermediate Grades," Reading and Inquiry, 10 (1965), 303-06.

To determine whether students in grades 4, 5, and 6 would show significant gains in verbal problem solving performance subsequent to special instruction in selected arithmetic-reading skills, an investigation was conducted into the relationship between reading competence and problem solving. The usefulness of the experimental teaching materials to provide for effective instruction in verbal problem solving and the ability of the experimental test instrument to measure children's competence in reading arithmetic problems were also studied. The experimental program was followed by 39 fourth-, fifth-, and sixth-grade classes, while 39 similar classes continued their regular arithmetic programs. A series of 20 45-minute lessons including two sets of verbal problems developed around 10 skill areas was taught weekly by the experimental class teachers. It was concluded that children who received special instruction in reading arithmetic problems appeared to gain both in reading and arithmetic performance. Skills instruction related to vocabulary, the literal interpretation of problems, and the selection of the proper solution process were most effective. The experimental Reading-Arithmetic Skills Program Test substantially contributed to the measurement of the arithmetic reading competencies of intermediate grade children. A table and references are included.

3713
Curry, John Foster. "The Effect of Reading Instruction upon Achievement in Seventh Grade Arithmetic," Studies in Education, (1955), 123-27. Thesis Abstract Series, School of Education, Indiana University, No. 7, 1956.

A study designed to determine the effect of reading instruction by a classroom mathematics teacher upon achievement in seventh-grade arithmetic is reported. The experiment was conducted during the second semester of the school year at Western Hills High School, Cincinnati. The subjects were 132 seventh-grade pupils. Two classes made up the experimental group and two classes were considered controls. Each group had one "A" math class and one "B" class. During the study both groups covered the same material in the textbook. At the beginning of the semester, both groups were given the Traxler Silent Reading Test, Form 1, for grades 7 to 10 and the Arithmetic Test (Fundamentals and Reasoning), Form A, Municipal Test, grades 6 to 8. At the close of the semester different forms of the same test were given. All were subjected to statistical analysis. The null hypothesis that there was no difference between the means was set up. The null hypothesis was accepted. For this population, reading instruction proved beneficial for the experimental group, but did not bring a sufficient increase in arithmetic to be significant at the 5 percent level. The best arithmetic achievers benefited most from reading instruction, but the difference in the means was not significant. On three divisions of the arithmetic test (computation, problem analysis, and problems, the experimental group made greater gains than the control group. The experimental group made greater gains in reading than the controls, but the difference was not significant. Some implications for teaching and recommendations are given.

5097
D'Augustine, C. H. "Factors Relating to Achievement with Selected Topics in Geometry and Topology," Arithmetic Teacher, 13 (1966), 192-97.

The factors which relate to a student's achievement with geometrical and topological topics were investigated. The study was conducted at the fifth-, sixth-, and seventh-grade levels, using 90 students at each grade level. The experimental design used a programed test which presented such topics as paths and their properties, simple closed paths, polygons, and classification of polygons based on nonmetric properties. Each student worked independently at his own rate. Upon completion of the programed text, each student was administered a test of the topics studied. Reading achievement and arithmetic achievement were isolated as significant factors in achievement with topics of topology and geometry when taught with a programed text. Mental age and chronological age did not significantly affect achievement. Shorter working periods proved more efficient in terms of completion times at each grade level studied. The most efficiency was achieved by the sixth grade. Further research is needed.

3613
Dunn, Lloyd M., and Capobianco, Rudolph J. "Studies in Reading and Arithmetic in Mentally Retarded Boys: I. A Comparison of the Reading Processes of Mentally Retarded and Normal Boys of the Same Mental Age," Monographs of the Society for Research in Child Development, Inc., XIX, No. 1 (1954). Child Development Publications, Purdue University, 1956.

Two studies are reported. The purpose of the first study was to compare educable mentally retarded boys in special classes with mentally normal boys of the same mental ages in the regular classes on some aspects of the reading process. The aspects of the reading process were spelling, reading comprehension, oral reading, word recognition, blending, ability to use content clues, eye movements, hearing, handedness, eyedness, and pupil adjustment and home conditions. The study was designed to provide data which would have implications for teaching methodology. The purpose of the second investigation was to examine some of the quantitative and qualitative differences in performance between endogenous and exogenous boys in the area of arithmetic achievement. Computation, reasoning, habits of computation, and general aspects of arithmetic achievement were measured. Procedures, results, conclusions, tables, and a bibliography are included for each study.

3010
Faison, Edmund W. J. "Readability of Children's Textbooks," Journal of Educational Psychology, XLII (January, 1951), 43-51.

The readability of fifth-, sixth-, seventh-, and eighth-grade textbooks used in two school systems in Washington, D.C. was studied by means of the Flesch readability formula. A modified procedure was followed for the mathematics textbooks. A total of 38 books, one for each grade and subject, were rated on reading ease and human interest. All books showed a progressive decrease in reading ease from the fifth through the eighth grades. The smallest difference was between the seventh and eighth grades. In an over-all ranking in reading ease from the most difficult to the easiest, the mathematics books ranked first. They were followed by the history, science, English, and literature books. When ranked from the least interesting to the most interesting, the science books placed first and were followed by the mathematics, history, English and literature books. An attempt to personalize the contents was apparent only in the mathematics books. Tables and references are included.

6143
Fay, Leo. "Reading Study Skills: Math and Science," Reading and Inquiry, 10 (1965), 92-94.

Concludes that elementary teachers must guide children in applying reading study skills in their content fields, especially math and science.

3618
Filano, Albert E. "The Ability of College Freshmen to Read Mathematics Texts Independently with Understanding," School Science and Mathematics, LVII (January, 1957), 16-18.

The extent to which college freshmen can comprehend elements of analytic geometry from reading the textbook is reported. Six sections of freshmen students enrolled in a mathematics course taught at Pennsylvania State University served as the experimental and control groups. The control groups were taught a unit on hyperbola by the usual techniques. The experimental group was given no instruction but was told to read the textbook. A test was administered at the close of the unit. The Peters Regression technique was used to analyze the data. The experimental group surpassed its predicted achievement, but the difference was not significant. The effects of transfer outside guidance and final test motivation are discussed. Two references are included.

4068
Forseth, William J. "Does the Study of Geometry Help Improve Reading Ability?" Mathematics Teacher, LIV (January, 1961), 12-13.

The reading test scores of tenth-grade students in three Minnesota high schools tested in the fall and again the following spring were analyzed to determine if the study of geometry helped improve reading ability. Equivalent groups, matched student by student for intelligence, initial reading ability, and school, were compared for amount of reading improvement made during the year. Comparisons were made on the Schrammel-Gray High School and College Reading Test for reading gross comprehension, reading rate, and reading comprehension-efficiency. In the three equivalent-group comparisons between geometry and nongeometry groups, the geometry groups showed gains over the nongeometry groups which were significant. In the nine group comparisons made for biology, home economics, and industrial arts, none of the gains in reading was significant, nor did any approach significance.

5120
Frost, B. P. "Intelligence, Manifest Anxiety and Scholastic Achievement," Alberta Journal of Educational Research, 11 (1965), 167-75.

Two studies were made to determine the relationship between general and test anxiety and scholastic achievement in Canadian children. The first study was made with 55 fourth-grade children at a Calgary, Alberta, elementary school in a middle-class area. The second concerned 113 sixth-grade children from two elementary schools in Calgary, one in a middle-class area and one in a lower-middle and working-class area. Both studies showed a negative relationship between manifest anxiety as measured by the Children's Manifest Anxiety Scale (CMAS) and scholastic achievement as measured by either standardized tests or by teachers' marks. The value of the CMAS other than as a first screening device is questioned. The results which differ with earlier findings on the question are discussed. References and tables are included.

6345
Gilmary, Sister. "Transfer Effects of Reading Remediation to Arithmetic Computation When Intelligence is Controlled and All Other School Factors are Eliminated," Arithmetic Teacher, 14 (January, 1967), 17-20.

The possible transfer from learning situations involving linguistic symbols to learning situations involving quantitative symbols was studied. The experimental group received help in both reading and arithmetic, while the control group took arithmetic only. Pre-tests and post-tests were used to measure progress during the 6-week period. Significant grade score gains were made by the experimental group. Teaching-learning effects of the reading classes had a significant transfer value in the arithmetic classes and should be considered as a major interdisciplinary aim. Further investigation is suggested. References are included.

2909
Glennon, Vincent J. "Arithmetic 1949: Testing Meanings in Arithmetic," Supplementary Educational Monographs, 70 (November, 1949), University of Chicago Press, 64-74.

Lag in the development of adequate techniques for measuring arithmetical understandings and meanings could be due to: (1) the changing role of arithmetic, (2) the impact of physiological psychology on teaching techniques, (3) teachers' confidence in conventional practices, (4) the arbitrary associations view of arithmetic, (5) the influence of tests on teaching objectives, and (6) the lack of definitive lists of basic understandings. This lag, in turn, resulted in lack of research in the area. This frontier study investigated the extent to which students beyond grade six have acquired basic arithmetical understandings. An 80-item multiple-choice test was given to 1,139 subjects at seven educational levels. Results showed that at the seventh-grade level the average student had acquired 12.5 percent of the understandings, 14 percent at the eighth-grade level, 18 percent at the ninth-grade level, and 37 percent at the 12th-grade level. No results were reported for other subjects tested. Since the results offer limited evidence, it is suggested that the study be replicated at all grade levels with various techniques. This paper was presented at the Fourth Annual Conference on Arithmetic at the University of Chicago in 1949 and is included in "Arithmetic 1949," a supplementary educational monograph.

4882
Graubard, Paul S. "The Extent of Academic Retardation in a Residential Treatment Center," Journal of Educational Research, 58 (October, 1964), 78-80.

A follow-up study of Tamkin's work to determine the frequency and extent of educational disability in emotionally disturbed children is described. It was hypothesized that the disturbed population would have severe retardation in both reading and mathematics and that there would be no significant difference in achievement in the two academic areas. Twenty-one boys, aged 10 to 16 years, who were under residential psychiatric treatment for periods of from 2 to 8 years were given the Wechsler Intelligence Scale for Children tests and the Metropolitan and Stanford Achievement Tests. The hypotheses were confirmed by the results. Academic disability was predominant among disturbed children. There was no significant difference between reading comprehension and arithmetic achievement. Some differences between the Tamkin's research and this study are discussed.

4237
Groff, Patrick J. "Children's Attitudes Toward Reading and Their Critical Reading Abilities in Four Content-Type Materials," Journal of Educational Research, 55 (April, 1962), 313-17.

An experiment designed to determine how a child's attitude toward the content of the material being read affects test scores of critical reading is reported. The subjects, 305 fifth and sixth graders of average ability, were given these three attitude questionnaires to complete: Remmers' Scale for Measuring Attitude Toward Any School Subject, Tenenbaum's School Attitudes Questionnaire, and a modified form of Thorndike's Fictitious Annotated Titles Questionnaire. Four original experimental reading passages, and an experimental reading test consisting of reading for immediate recall and of critical reading were administered. Significant differences and coefficients of correlations were obtained between all the experimental and personal variables in the study. Data from the sex groups and the total group were intercorrelated. The findings seemed to indicate that the reading comprehension of an individual child as he reads is influenced to a degree by his attitude toward the content type of material being read. References and tables are included.

4888
Halliwell, Joseph W., and Stein, Belle W. "A Comparison of the Achievement of Early and Late School Starters in Reading Related and Non-reading Related Areas in Fourth and Fifth Grades," Elementary English, 41 (October, 1964), 631-39.

A school system in suburban Long Island participated in a study of the effects of early and late school entrance on achievement in reading related and nonreading related subject areas at the end of the fourth and fifth grades. About 70 fourth graders and 70 fifth graders enrolled in the school district for the school year 1960-61 participated. Two modal age groups for each grade level were compared: late-entrants who entered first grade at 76 to 81 months and early-entrants who entered at 70 to 75 months. A phase of the study used Hampleman's approach and compared the oldest modal age group which entered at 79 to 81 months with the youngest group which entered at 70 to 72 months. Mean IQ and achievement scores in vocabulary, comprehension, arithmetic reasoning, arithmetic fundamentals, language, and spelling were obtained for each subgroup and grade level. Results showed that the older fourth graders were significantly superior to the younger fourth graders in all subject areas except arithmetic fundamentals. The same trend was observed for the fifth graders. These results support earlier findings that early school entrance adversely affects school achievement and that early-entrants may do well in comparison with late-entrants of less ability, but not with those of similar ability.

3319
Hamilton, R. C. S. "The Construction and Administration of a Reading Comprehension Test Using Mathematical Material," British Journal of Educational Psychology, XXIII (November, 1953), 203-05.

An investigation to provide an instrument for the measurement of reading comprehension of mathematical material appearing in textbooks and in problem solving is summarized. The construction of the test of reading comprehension is described. The test was used to investigate the relevant problems of prognosis and diagnosis in respect to mathematical achievement. Tables are included.

3627
Harper, R. J. C. "Reading and Arithmetic Reasonings. A Partial Correlation and Multiple Regression Analysis," Alberta Journal of Educational Research, III (June, 1957), 81-86.

The extent to which variance in reading comprehension and word knowledge contributes to variance in arithmetic reasoning was investigated. Standardized achievement and intelligence tests were administered to 159 second graders from 14 graded rural schools in Alberta. A partial and multiple correlational analysis of the Average Reading, Arithmetic Reasoning, and Arithmetic Computation Grade Scores suggested a significant relationship between Average Reading Scores and Arithmetic Reasoning Scores, even when age and intelligence were partialled out. Variance in Average Reading Scores contributed substantially to variance in Arithmetic Reasoning. The findings implied that if a causal relationship existed between reading achievement and arithmetic reasoning, this factor must be considered in teaching at the primary grade levels.

4894
Heddens, James W., and Smith, Kenneth J. "The Readability of Elementary Mathematics Books," Arithmetic Teacher, 11 (November, 1964), 466-68.

The readability of five commercial arithmetic texts for grades 1 - 6 was examined. The Spache readability formula was used to analyze the readability of primary books (Grades 1-3). Dale-Chall's formula was used to analyze the readability level of intermediate books (Grades 4-6). The following conclusions were made. The readability level of selected commercial texts as determined by the formulas was generally above the assigned grade level. There was considerable variation of readability level among the textbooks. The variation within each textbook indicated that some portions of texts should be comprehended by most students. Other portions were written on a more difficult level. Two tables and references are included.

6361
Henderson, Edmund H., and Long, Barbara H. "Self Social Concepts in Relation to Reading Arithmetic," Vistas in Reading, 11, Part 1, (1966), 576-81.

A nonverbal method for investigating self-social concepts of high achieving readers selected on the basis of high and low reading achievement in arithmetic was studied. Attention was focused on esteem, identification, dependency, and complexity -- all were assumed to be part of an integrated system. Statistical findings characterized the high reader in arithmetic as one who was socially oriented and saw himself as different and complex. For boys this was a relatively low esteem role, and they related more closely to the teacher. For girls the verbal role appeared more compatible. References are listed.

3737
Himmler, Merwin L. "An Analysis and Evaluation of a Television Demonstration of the Teaching of Fifth-Grade Reading, Arithmetic, and French," Pittsburgh Schools, XXXI (March - June, 1957), 129-86.

A television demonstration of the day-to-day teaching of fifth-grade reading, arithmetic, and French in 16 Pittsburgh city and area schools was analyzed and evaluated. Comparisons were made between 20 TV classes (experimental) and 19 nonTV classes (control) for reading and arithmetic. Identical textbooks, courses of study, dictionaries, workbooks, and time allotments were used for the experimental and control classes. Data were gathered from intelligence tests given at the beginning of the term and standardized achievement tests administered at the beginning and end of the term. Separate matched groups in reading and in arithmetic were drawn up on the basis of these scores. A teacher-made French test was administered over television at the end of the term. Five questionnaires were designed and administered throughout the term to obtain observations and reactions from teachers, pupils, parents, and principals. Analysis was made of questionnaire responses and of pre- and post-test data for the matched groups. Details concerning teaching materials, time arrangements, selection of teachers, organization of TV teaching, and teaching methods are given. It is concluded that there may be little observable difference between the instructional effectiveness of TV teaching and regular classroom teaching, although the control group had significantly higher grade equivalent scores in reading and arithmetic. A detailed discussion of the findings and their implications is given. Tables and a bibliography are included.

4245
Holowinsky, Ivan. "The Relationship Between Intelligence (80-110 I.Q.) and Achievement in Basic Educational Skills," Training School Bulletin, 58 (May, 1961), 14-21.

The hypothesis that all students within the ranges of the dull-normal and average intelligence are equally able to master basic educational skills was investigated. Fifteen groups of 25 students each, 12-17 years of age and within the 80-110 IQ range, were selected and organized into five larger groups according to age level and three groups according to IQ level. The following tests were administered: the Otis Quick Scoring Mental Ability Test, Beta and Gamma forms; the California Reading Test, form AA; and the arithmetic part of the Wide Range Achievement Test. Data were collected on (1) achievement in reading at various IQ and age levels, (2) achievement in arithmetic at various IQ and age levels, (3) relationships between achievement in reading and arithmetic, (4) relationships between grade placement and educational achievement, and (5) the top grade levels which these students attained depending upon their IQ or mental potential. A moderately high relationship between IQ and reading, which varied depending upon age level, was shown. Considering the narrow IQ range studied (80-110), striking differences of achievement were found. Only a very moderate relationship between IQ and arithmetic was apparent. No appreciable difference was found in the average achievement of boys and girls. The significance and implications of the findings are discussed. Tables are included.

3630
Johnson, Donovan A. "The Readability of Mathematics Books," Mathematics Teacher, L (February, 1957), 105-10.

Eighteen mathematics books used as texts or supplementary books in the secondary school were analyzed. Previous findings concerning the readability of mathematics textbooks and the application of the Dale-Chall and Flesch readability formulas are discussed. Data are given for the readability level of three seventh-grade arithmetic texts, three eighth-grade arithmetic texts, two elementary algebra texts, three plane geometry texts, and seven supplementary mathematics books, as determined by the revised Flesch Reading Ease Scale. The seventh- and eighth-grade books were more difficult than the grade level for which they were intended, while the algebra books were approximately the right level. The geometry texts were at or below the grade for which they were written. A wide variety of reading levels (grades 8 to 15) was found in the supplementary books. Similar findings in a study by Thompson are reported. A recommendation for careful consideration of readability scores in the selection of mathematics texts is made. References and tables are included.

3118
Johnson, Mary E. "The Vocabulary Difficulty of Content Subjects in Grade Five," Elementary English, XXIX (May, 1952), 277-80.

The understanding of vocabulary in six content fields--arithmetic, geography, history, science, health, and literature--by fifth-grade children in the towns of Hampton and Phoebus, Virginia, was studied. A vocabulary test of 150 multiple-choice items using from one to five meanings per word was constructed from a list of 1,500 fairly difficult words found in fifth-grade textbooks. Words used in the test were checked against the Thorndike List of 30,000 words and against Luella Cole's Technical Vocabulary List. After a preliminary tryout, the test was revised and administered to 684 fifth-grade pupils. The data were analyzed for number of correct responses on each item, relative order of difficulty of the six subject matter areas. It was concluded from the test results that a program of word enrichment was needed for the understanding of textbooks used in the content subjects because the pupils tested did not seem to be equipped to deal with the vocabularies of the various fields. Tables and references are given.

4425
Kamii, Constance K., and Weikart, David P. "Marks, Achievement, and Intelligence of Seventh Graders Who Were Retained (Non-Promoted) Once in Elementary School," Journal of Educational Research, 56 (May-June, 1963), 452-59.

A study of non-promotion was made in Ypsilanti, Michigan, using seventh graders in two junior high schools as subjects. A group of 31 pupils who were retained once prior to sixth grade were described and compared with a random sample of 31 pupils who had never been retained. Marks, achievement levels, and intelligence test scores were studied. The retained pupils had marks in academic subjects that were significantly below the average of the regularly promoted seventh graders. Their achievement levels in reading and arithmetic and their I.Q.'s were significantly lower, although more than half of the low achievers had at least average intelligence. Different teaching methods, aimed at enhancing positive motivation and better social and personal adjustment, are suggested as a more effective solution than retention. Further research is necessary to determine what kinds of pupils benefit from retention before educators can justifiably retain pupils of elementary school age. Tables and references are included.

4093
Kerfoot, James F. "The Vocabulary in Primary Arithmetic Texts," The Reading Teacher, XIV (January, 1961), 177-80.

The problem of vocabulary in arithmetic texts is reviewed. Arithmetic word lists for the first and second grades were compiled, and six arithmetic textbook series were examined to determine which words appeared so frequently as to be considered basic. A list of words which appeared in at least three textbooks and had a total frequency of ten or above was developed. To determine vocabulary difficulty, each word in the list was checked with two lists of words considered easy for children, the Dale List of 769 Easy Words, and the revised Gates List of Vocabulary for the Primary Grades. A list of 49 words, which appeared in either the Gates or Dale list was compiled for the first grade. A second-grade list of 370 words was developed, and sixty-two of these words did not appear in either the Gates list or the Dale list. A reference and the word lists are included.

6388
Kingston, A.J. (Ed.) "Research for the Classroom: Content Textbook--Help or Hindrance?" By W. Hill. Journal of Reading, 10 (1967), 408-13.

Research is cited to indicate the formidable reading-learning task presented by the American content area textbook. Criticism refers to the density of concepts, the difficult vocabulary, and the generalized impersonal style of presentation. Texts in mathematics, science, and history have specific problems in readability. Favorable results from modification through re-writing and creative teaching are cited. The evidence gained from research and experimental teaching tends to confirm the contention that the content area textbook, as traditionally used, probably is a real hindrance to the student as a tool for learning. A systematic program of instruction is urged for the development of comprehension-study skills for more successful mastery of all content area textbooks. A bibliography is offered.

3123
Kohler, Richard C. "Use of Arts Activities with Reading, Science, and Arithmetic," Elementary School Journal, LII (February, 1952), 355-59.

A critical analysis of the types of arts activities recommended by textbook writers for use in the teaching of reading, science, and arithmetic is reported. The analysis revealed that 37 types of activities were recommended for integration of the selected subjects. A distribution of types of activities by grades indicated that 11 types of arts activities were common to all three curriculum areas. Nine types were exclusive to reading and three types to science. None appeared exclusively with the arithmetic program. Findings indicate that a greater variety of types was adaptable to the teaching of reading and science than for the teaching of arithmetic. More different types of activities were suitable for integrated teaching at the primary level than at the upper elementary level. The implications of the study are discussed.

5542
Langston, Genevieve Reitzell. "A Study of the Effect of Certain Structured Experiences in Science, Social Science, and Mathematics on Beginning Reading in Gifted Five Year Olds," Ph.D., University of Illinois, 1964. XXV, No. 2, 1049. (Order No. 64-8405, Microfilm $2.75; Xerography $7.80, 167 pages.)

The effect of 77 reading lessons (Richards and Gibson Methodology) and certain structured experiences in the content areas of mathematics, social science, and science on the oral reading, word knowledge, and word discrimination ability of a group of 48 gifted five-year-old children was investigated. The total group was divided into a control and an experimental group. Both groups were given the reading lessons. Only the experimental group was subjected to the structured experiences in the content areas. Gray's Oral Reading Paragraphs and the Metropolitan Achievement Test were the tests used. The statistical techniques included the use of the Chi Square test, z-scores, and Spearman's coefficient of rank correlation. There were no significant differences in oral reading, silent reading of both sentences and paragraphs, word knowledge, or word discrimination.

3525
Lanton, Wendell Cuthbert. "Comparison of the Reading, Arithmetic, Spelling Achievement of Third and Fifth Grade Pupils in 1953 and in 1934," Dissertation Abstracts XIV (No. 10, 1954). See also The Past-Present Achievement of Evanston School Children. NEA Research Division, National Education Association of the United States, Washington, D.C., September, 1954.

An investigation to determine how a group of elementary school children compared in 1953 in achievement with children of approximately two decades ago is reported. Achievement in reading, arithmetic, and spelling of 1290 pupils from selected elementary schools in Evanston, Illinois, was measured by the 1933 edition of the Metropolitan Achievement Tests, and scores were compared with those obtained by the same number of pupils in 1934. Comparisons were made by subgroups according to sex, grade, school, and subtest. Results show that the third- and fifth-grade pupils achieved higher scores on standardized educational tests administered in 1953 than did comparable groups tested in the same way in 1934. It is suggested that educational attainment has not deteriorated in the past 20 years.

5550
Lichter, Solomon Sidney. "Achievement in Reading and Arithmetic of the Pupils in a Junior High School as It is Affected by the Development and Use of a Behavioral Change Process," Ed.D., New York University, 1964.

Chairman: John C. Robertson, Vol. XXV, No. 2, 1049-1050. (Order No. 64-8478, Microfilm $2.75; Xerography $8.60, 188 pages.)

The effect of the behavioral change process on the reading and arithmetic achievement of seventh-grade pupils was investigated. Tests and other instruments used in the study included the principals' questionnaire, the teachers' observation form, standardized achievement tests in arithmetic and reading, and standardized intelligence tests. The analysis of covariance was the statistical technique used in the study. The author states in his list of major findings that achievement scores in reading and arithmetic of seventh-grade students involved in this study reflected no significant gains.

5196
Long, Barbara H., and Henderson, E.H. "Originality, Reading, and Arithmetic," Perceptual and Motor Skills, 21 (1965), 553-54.

A study was conducted to determine whether the imagination of a highly original child would contribute to his interest in reading and to his ability to hypothesize plot development, yet hinder his ability to solve arithmetic problems. Tolerance's Parallel Lines Test (1962), a non-verbal test of creativity, was given to 111 pupils. The 15 highest scoring boys and 15 highest scoring girls were selected to form the "original" group. The 15 lowest scoring boys and 15 lowest scoring girls were selected to form the "non-original" group. The reading and arithmetic scores from the Iowa Tests of Basic Skills of the both groups were examined. Analysis of variance revealed an effect for I.Q. (Otis) and an interaction between originality, reading, and arithmetic. References are given.

3637
Lynn, R. "The Temperamental Characteristics Related to Disparity of Attainment in Reading and Arithmetic," British Journal of Educational Psychology, XXVII (February, 1957), 62-67.

The results of an investigation of the relation of levels of attainment in reading and arithmetic to temperamental characteristics, especially feelings of anxiety, are reported. Previous studies suggested the hypothesis that there was general relationship between anxiety, good reading, and arithmetic. The relation of anxiety to reading-arithmetic disparity was studied among: (a) a group of 80 unselected normal boys and girls attending a primary school and (b) 45 normal boys attending a secondary modern school. All were given appropriate forms of the Schonell Graded Reading Test, attainment tests in arithmetic, and anxiety tests. A disparity score was derived by subtracting the arithmetic age from the reading age. The results of the anxiety tests and their relation to attainment disparity are given. In both groups there was a tendency for anxious children to be better in reading than in arithmetic. For primary children the relation of anxiety to attainment disparity was significant at the 5 percent level. This tendency might be due to the greater amount of time which anxious children spend on reading as a way of dealing with their anxieties. Several hypotheses for further research are suggested. A bibliography and tables are included.

3871
Lynn, R. "Disparity of Attainment in Reading and Arithmetic," British Journal of Educational Psychology, XXVIII (November, 1958), 277-80.

A discussion of the disparity of attainment in reading and arithmetic is reported. The criticisms of Reed and Schonfield are considered. Interpretations of studies concerned with the relationship between anxiety and good verbal ability in relation to perceptual and performance ability are discussed. References are included.

3237
Malter, Morton S. "Studies of the Effectiveness of Graphic Materials," Journal of Educational Research, XLVI (December, 1952), 263-73.

Ten studies concerned with the relative effectiveness of various types of graphic materials are reviewed. A table presents the following information about each of the studies: author, the year of the report, purpose, the number of pupils tested, grade level tested, materials employed, and method of presenting the materials. In seven of the studies, no attempt was made to teach graphic interpretation during the course of the investigation. A bibliography of the 10 studies reviewed is included.

6417
McCreary, J.R. "Reading Tests with Maori Children," New Zealand Journal of Educational Studies, 1 (1966), 40-50.

The difficulties of Maori children in reading and understanding written English were investigated by giving a battery of tests to all children above Standard 2 at the local Maori school. The A.C.E.R. Tests standardized for New Zealanders were administered in 1958. The same tests and the Otis Intelligence Tests were given again in 1961. The A.C.E.R. Tests consisted of Word Knowledge, Speed of Reading, Reading for Meaning, Oral Word Reading, and Arithmetic. All tests were given by the classroom teachers as part of the daily classroom routine. Scoring was done for attainment groups for each chronological age. Median raw scores were computed for each class. The median assessed as the upper limit of the fifth attainment group served as the pakeha norms with which Maori performance was compared. Results were based on the performance of 43 Maori children in 1958 and 57 Maori children in 1961. It was found that Maori children start with a language handicap when they enter a pakeha educational system. They are most handicapped in word knowledge and understanding printed English. They recognize words, but fail to grasp the meaning of words. The problem was greater in reading and understanding than in arithmetic. It is recommended that learning situations which allow learning words in a wide variety of contexts be provided.

6437
Morris, J.L., Pestaner, Mariana, and Nelson, A. "Mobility and Achievement," Journal of Experimental Education, 35 (1967), 74-80.

A study of the effect of mobility on reading and arithmetic achievement involved 410 Caucasian fifth-graders in northern Alameda County, California. Information on I.Q., reading and arithmetic achievement scores, the number of schools attended, and the socioeconomic status of the family was obtained for each child. The subjects were divided into three groups according to the number of schools attended. The distribution of scores in reading and arithmetic was also divided into thirds, and the frequency of occurrence of scores for students differing in mobility was calculated. Results presented in four tables indicate that variation in the reading scores, but not in the arithmetic scores of mobile children was greater than the variation for non-mobile children. However, when the mean reading and arithmetic scores of both groups were compared, no statistically significant difference was observed. This study showed that mobility has an effect on reading achievement but not on arithmetic achievement. However, personality variables were not considered.

5244
Perrodin, A.F., and Snipes, W.T. "The Relationship of Mobility to Achievement in Reading, Arithmetic, and Language in Selected Georgia Elementary Schools," Journal of Educational Research, 59 (1966), 315-19.

The relationship between mobility and pupil achievement in reading, arithmetic, and language at the sixth-grade level in selected Georgia elementary schools was studied. Subjects were 483 sixth-grade pupils in six elementary schools in a central Georgia county school system. Data were obtained from the California Short-Form Test of Mental Maturity (Form S), California Achievement Tests Complete Battery (Form W), and a Personal Data Form. Mobility was determined by number, recency, and distance of moves. The subjects were grouped according to sex, age, socio-education as determined by the Hollingshead Two Factor Index of who were divided into experimental and control groups and were matched on IQ, aptitude, and prior achievement. The experimental group received instruction in reading mathematical problems while the control group did not. The experiment ran 10 days. A teacher-made word problem test was administered to both groups. A frequency distribution, means, and standard deviations were used to analyze the data. Provision was made in the data analysis for those students who used the correct procedure but made computational errors. The number of problems correct in the experimental group was 46, while the control group had 12 correct. The number of procedures correct were 69 and 24 for the experimental and control groups respectively. There appeared to be merit in teaching special reading skills for the solution of mathematics problems. Lesson plans and tables are included.

4202
Cleland, Donald L., and Toussaint, Isabella H. "The Interrelationships of Reading, Listening, Arithmetic Computation and Intelligence," Reading Teacher, 15 (January, 1962), 228-31.

The interrelationships among reading, listening, arithmetic computation, and intelligence were studied. One hundred seventy-two students enrolled in nine intermediate classes of two suburban schools of Western Pennsylvania were subjects. There was a slight bias in favor of the superior socioeconomic strata. Intelligence was measured by both the SRA Primary Mental Abilities (PMA), Form AH, and the Stanford-Binet Intelligence Scale, Form LM. Scores from these five group tests and one individual test were obtained for every pupil used: the Gates Reading Survey - Form 2, the Durrell-Sullivan Reading Capacity Test and the Sequential Test of Educational Progress Listening 4A, the American School Achievement, Form G, Part II, and Arithmetic Computation. The first part of the study determined the interrelationships among the selected measures by means of the correlation technique. In the second part, multiple coefficients of correlation were determined by the Doolittle method to determine the optimum weights to be assigned to the best combination of independent predictive variables. The STEP-Listening showed a closer relationship with reading achievement as measured by the Gates Reading Survey than the Durrell-Sullivan. The Stanford-Binet and the PMA showed approximately the same relationship with reading. Other conclusions and implications are given. Tables are included.

6142
Coulter, Myron L. "Changing Concepts of Reading Instruction in the Content Areas in the Intermediate Grades," Changing Concepts of Reading Instruction, 6 (1961), 35-38.

Reviews reasons why reading is important to curriculum and pinpoints concept changes in the areas of arithmetic, science, and social studies.

5089
Coulter, Myron L. "Verbal Problem Solving in the Intermediate Grades," Reading and Inquiry, 10 (1965), 303-06.

To determine whether students in grades 4, 5, and 6 would show significant gains in verbal problem solving performance subsequent to special instruction in selected arithmetic-reading skills, an investigation was conducted into the relationship between reading competence and problem solving. The usefulness of the experimental teaching materials to provide for effective instruction in verbal problem solving and the ability of the experimental test instrument to measure children's competence in reading arithmetic problems were also studied. The experimental program was followed by 39 fourth-, fifth-, and sixth-grade classes, while 39 similar classes continued their regular arithmetic programs. A series of 20 45-minute lessons including two sets of verbal problems developed around 10 skill areas was taught weekly by the experimental class teachers. It was concluded that children who received special instruction in reading arithmetic problems appeared to gain both in reading and arithmetic performance. Skills instruction related to vocabulary, the literal interpretation of problems, and the selection of the proper solution process were most effective. The experimental Reading-Arithmetic Skills Program Test substantially contributed to the measurement of the arithmetic reading competencies of intermediate grade children. A table and references are included.

3713
Curry, John Foster. "The Effect of Reading Instruction upon Achievement in Seventh Grade Arithmetic," Studies in Education, (1955), 123-27. Thesis Abstract Series, School of Education, Indiana University, No. 7, 1956.

A study designed to determine the effect of reading instruction by a classroom mathematics teacher upon achievement in seventh-grade arithmetic is reported. The experiment was conducted during the second semester of the school year at Western Hills High School, Cincinnati. The subjects were 132 seventh-grade pupils. Two classes made up the experimental group and two classes were considered controls. Each group had one "A" math class and one "B" class. During the study both groups covered the same material in the textbook. At the beginning of the semester, both groups were given the Traxler Silent Reading Test, Form 1, for grades 7 to 10 and the Arithmetic Test (Fundamentals and Reasoning), Form A, Municipal Test, grades 6 to 8. At the close of the semester different forms of the same test were given. All were subjected to statistical analysis. The null hypothesis that there was no difference between the means was set up. The null hypothesis was accepted. For this population, reading instruction proved beneficial for the experimental group, but did not bring a sufficient increase in arithmetic to be significant at the 5 percent level. The best arithmetic achievers benefited most from reading instruction, but the difference in the means was not significant. On three divisions of the arithmetic test (computation, problem analysis, and problems, the experimental group made greater gains than the control group. The experimental group made greater gains in reading than the controls, but the difference was not significant. Some implications for teaching and recommendations are given.

5097
D'Augustine, C. H. "Factors Relating to Achievement with Selected Topics in Geometry and Topology," Arithmetic Teacher, 13 (1966), 192-97.

The factors which relate to a student's achievement with geometrical and topological topics were investigated. The study was conducted at the fifth-, sixth-, and seventh-grade levels, using 90 students at each grade level. The experimental design used a programed test which presented such topics as paths and their properties, simple closed paths, polygons, and classification of polygons based on nonmetric properties. Each student worked independently at his own rate. Upon completion of the programed text, each student was administered a test of the topics studied. Reading achievement and arithmetic achievement were isolated as significant factors in achievement with topics of topology and geometry when taught with a programed text. Mental age and chronological age did not significantly affect achievement. Shorter working periods proved more efficient in terms of completion times at each grade level studied. The most efficiency was achieved by the sixth grade. Further research is needed.

3613
Dunn, Lloyd M., and Capobianco, Rudolph J. "Studies in Reading and Arithmetic in Mentally Retarded Boys: I. A Comparison of the Reading Processes of Mentally Retarded and Normal Boys of the Same Mental Age," Monographs of the Society for Research in Child Development, Inc., XIX, No. 1 (1954). Child Development Publications, Purdue University, 1956.

Two studies are reported. The purpose of the first study was to compare educable mentally retarded boys in special classes with mentally normal boys of the same mental ages in the regular classes on some aspects of the reading process. The aspects of the reading process were spelling, reading comprehension, oral reading, word recognition, blending, ability to use content clues, eye movements, hearing, handedness, eyedness, and pupil adjustment and home conditions. The study was designed to provide data which would have implications for teaching methodology. The purpose of the second investigation was to examine some of the quantitative and qualitative differences in performance between endogenous and exogenous boys in the area of arithmetic achievement. Computation, reasoning, habits of computation, and general aspects of arithmetic achievement were measured. Procedures, results, conclusions, tables, and a bibliography are included for each study.

3010
Faison, Edmund W. J. "Readability of Children's Textbooks," Journal of Educational Psychology, XLII (January, 1951), 43-51.

The readability of fifth-, sixth-, seventh-, and eighth-grade textbooks used in two school systems in Washington, D.C. was studied by means of the Flesch readability formula. A modified procedure was followed for the mathematics textbooks. A total of 38 books, one for each grade and subject, were rated on reading ease and human interest. All books showed a progressive decrease in reading ease from the fifth through the eighth grades. The smallest difference was between the seventh and eighth grades. In an over-all ranking in reading ease from the most difficult to the easiest, the mathematics books ranked first. They were followed by the history, science, English, and literature books. When ranked from the least interesting to the most interesting, the science books placed first and were followed by the mathematics, history, English and literature books. An attempt to personalize the contents was apparent only in the mathematics books. Tables and references are included.

6143
Fay, Leo. "Reading Study Skills: Math and Science," Reading and Inquiry, 10 (1965), 92-94.

Concludes that elementary teachers must guide children in applying reading study skills in their content fields, especially math and science.

3618
Filano, Albert E. "The Ability of College Freshmen to Read Mathematics Texts Independently with Understanding," School Science and Mathematics, LVII (January, 1957), 16-18.

The extent to which college freshmen can comprehend elements of analytic geometry from reading the textbook is reported. Six sections of freshmen students enrolled in a mathematics course taught at Pennsylvania State University served as the experimental and control groups. The control groups were taught a unit on hyperbola by the usual techniques. The experimental group was given no instruction but was told to read the textbook. A test was administered at the close of the unit. The Peters Regression technique was used to analyze the data. The experimental group surpassed its predicted achievement, but the difference was not significant. The effects of transfer outside guidance and final test motivation are discussed. Two references are included.

4068
Forseth, William J. "Does the Study of Geometry Help Improve Reading Ability?" Mathematics Teacher, LIV (January, 1961), 12-13.

The reading test scores of tenth-grade students in three Minnesota high schools tested in the fall and again the following spring were analyzed to determine if the study of geometry helped improve reading ability. Equivalent groups, matched student by student for intelligence, initial reading ability, and school, were compared for amount of reading improvement made during the year. Comparisons were made on the Schrammel-Gray High School and College Reading Test for reading gross comprehension, reading rate, and reading comprehension-efficiency. In the three equivalent-group comparisons between geometry and nongeometry groups, the geometry groups showed gains over the nongeometry groups which were significant. In the nine group comparisons made for biology, home economics, and industrial arts, none of the gains in reading was significant, nor did any approach significance.

5120
Frost, B. P. "Intelligence, Manifest Anxiety and Scholastic Achievement," Alberta Journal of Educational Research, 11 (1965), 167-75.

Two studies were made to determine the relationship between general and test anxiety and scholastic achievement in Canadian children. The first study was made with 55 fourth-grade children at a Calgary, Alberta, elementary school in a middle-class area. The second concerned 113 sixth-grade children from two elementary schools in Calgary, one in a middle-class area and one in a lower-middle and working-class area. Both studies showed a negative relationship between manifest anxiety as measured by the Children's Manifest Anxiety Scale (CMAS) and scholastic achievement as measured by either standardized tests or by teachers' marks. The value of the CMAS other than as a first screening device is questioned. The results which differ with earlier findings on the question are discussed. References and tables are included.

6345
Gilmary, Sister. "Transfer Effects of Reading Remediation to Arithmetic Computation When Intelligence is Controlled and All Other School Factors are Eliminated," Arithmetic Teacher, 14 (January, 1967), 17-20.

The possible transfer from learning situations involving linguistic symbols to learning situations involving quantitative symbols was studied. The experimental group received help in both reading and arithmetic, while the control group took arithmetic only. Pre-tests and post-tests were used to measure progress during the 6-week period. Significant grade score gains were made by the experimental group. Teaching-learning effects of the reading classes had a significant transfer value in the arithmetic classes and should be considered as a major interdisciplinary aim. Further investigation is suggested. References are included.

2909
Glennon, Vincent J. "Arithmetic 1949: Testing Meanings in Arithmetic," Supplementary Educational Monographs, 70 (November, 1949), University of Chicago Press, 64-74.

Lag in the development of adequate techniques for measuring arithmetical understandings and meanings could be due to: (1) the changing role of arithmetic, (2) the impact of physiological psychology on teaching techniques, (3) teachers' confidence in conventional practices, (4) the arbitrary associations view of arithmetic, (5) the influence of tests on teaching objectives, and (6) the lack of definitive lists of basic understandings. This lag, in turn, resulted in lack of research in the area. This frontier study investigated the extent to which students beyond grade six have acquired basic arithmetical understandings. An 80-item multiple-choice test was given to 1,139 subjects at seven educational levels. Results showed that at the seventh-grade level the average student had acquired 12.5 percent of the understandings, 14 percent at the eighth-grade level, 18 percent at the ninth-grade level, and 37 percent at the 12th-grade level. No results were reported for other subjects tested. Since the results offer limited evidence, it is suggested that the study be replicated at all grade levels with various techniques. This paper was presented at the Fourth Annual Conference on Arithmetic at the University of Chicago in 1949 and is included in "Arithmetic 1949," a supplementary educational monograph.

4882
Graubard, Paul S. "The Extent of Academic Retardation in a Residential Treatment Center," Journal of Educational Research, 58 (October, 1964), 78-80.

A follow-up study of Tamkin's work to determine the frequency and extent of educational disability in emotionally disturbed children is described. It was hypothesized that the disturbed population would have severe retardation in both reading and mathematics and that there would be no significant difference in achievement in the two academic areas. Twenty-one boys, aged 10 to 16 years, who were under residential psychiatric treatment for periods of from 2 to 8 years were given the Wechsler Intelligence Scale for Children tests and the Metropolitan and Stanford Achievement Tests. The hypotheses were confirmed by the results. Academic disability was predominant among disturbed children. There was no significant difference between reading comprehension and arithmetic achievement. Some differences between the Tamkin's research and this study are discussed.

4237
Groff, Patrick J. "Children's Attitudes Toward Reading and Their Critical Reading Abilities in Four Content-Type Materials," Journal of Educational Research, 55 (April, 1962), 313-17.

An experiment designed to determine how a child's attitude toward the content of the material being read affects test scores of critical reading is reported. The subjects, 305 fifth and sixth graders of average ability, were given these three attitude questionnaires to complete: Remmers' Scale for Measuring Attitude Toward Any School Subject, Tenenbaum's School Attitudes Questionnaire, and a modified form of Thorndike's Fictitious Annotated Titles Questionnaire. Four original experimental reading passages, and an experimental reading test consisting of reading for immediate recall and of critical reading were administered. Significant differences and coefficients of correlations were obtained between all the experimental and personal variables in the study. Data from the sex groups and the total group were intercorrelated. The findings seemed to indicate that the reading comprehension of an individual child as he reads is influenced to a degree by his attitude toward the content type of material being read. References and tables are included.

4888
Halliwell, Joseph W., and Stein, Belle W. "A Comparison of the Achievement of Early and Late School Starters in Reading Related and Non-reading Related Areas in Fourth and Fifth Grades," Elementary English, 41 (October, 1964), 631-39.

A school system in suburban Long Island participated in a study of the effects of early and late school entrance on achievement in reading related and nonreading related subject areas at the end of the fourth and fifth grades. About 70 fourth graders and 70 fifth graders enrolled in the school district for the school year 1960-61 participated. Two modal age groups for each grade level were compared: late-entrants who entered first grade at 76 to 81 months and early-entrants who entered at 70 to 75 months. A phase of the study used Hampleman's approach and compared the oldest modal age group which entered at 79 to 81 months with the youngest group which entered at 70 to 72 months. Mean IQ and achievement scores in vocabulary, comprehension, arithmetic reasoning, arithmetic fundamentals, language, and spelling were obtained for each subgroup and grade level. Results showed that the older fourth graders were significantly superior to the younger fourth graders in all subject areas except arithmetic fundamentals. The same trend was observed for the fifth graders. These results support earlier findings that early school entrance adversely affects school achievement and that early-entrants may do well in comparison with late-entrants of less ability, but not with those of similar ability.

3319
Hamilton, R. C. S. "The Construction and Administration of a Reading Comprehension Test Using Mathematical Material," British Journal of Educational Psychology, XXIII (November, 1953), 203-05.

An investigation to provide an instrument for the measurement of reading comprehension of mathematical material appearing in textbooks and in problem solving is summarized. The construction of the test of reading comprehension is described. The test was used to investigate the relevant problems of prognosis and diagnosis in respect to mathematical achievement. Tables are included.

3627
Harper, R. J. C. "Reading and Arithmetic Reasonings. A Partial Correlation and Multiple Regression Analysis," Alberta Journal of Educational Research, III (June, 1957), 81-86.

The extent to which variance in reading comprehension and word knowledge contributes to variance in arithmetic reasoning was investigated. Standardized achievement and intelligence tests were administered to 159 second graders from 14 graded rural schools in Alberta. A partial and multiple correlational analysis of the Average Reading, Arithmetic Reasoning, and Arithmetic Computation Grade Scores suggested a significant relationship between Average Reading Scores and Arithmetic Reasoning Scores, even when age and intelligence were partialled out. Variance in Average Reading Scores contributed substantially to variance in Arithmetic Reasoning. The findings implied that if a causal relationship existed between reading achievement and arithmetic reasoning, this factor must be considered in teaching at the primary grade levels.

4894
Heddens, James W., and Smith, Kenneth J. "The Readability of Elementary Mathematics Books," Arithmetic Teacher, 11 (November, 1964), 466-68.

The readability of five commercial arithmetic texts for grades 1 - 6 was examined. The Spache readability formula was used to analyze the readability of primary books (Grades 1-3). Dale-Chall's formula was used to analyze the readability level of intermediate books (Grades 4-6). The following conclusions were made. The readability level of selected commercial texts as determined by the formulas was generally above the assigned grade level. There was considerable variation of readability level among the textbooks. The variation within each textbook indicated that some portions of texts should be comprehended by most students. Other portions were written on a more difficult level. Two tables and references are included.

6361
Henderson, Edmund H., and Long, Barbara H. "Self Social Concepts in Relation to Reading Arithmetic," Vistas in Reading, 11, Part 1, (1966), 576-81.

A nonverbal method for investigating self-social concepts of high achieving readers selected on the basis of high and low reading achievement in arithmetic was studied. Attention was focused on esteem, identification, dependency, and complexity -- all were assumed to be part of an integrated system. Statistical findings characterized the high reader in arithmetic as one who was socially oriented and saw himself as different and complex. For boys this was a relatively low esteem role, and they related more closely to the teacher. For girls the verbal role appeared more compatible. References are listed.

3737
Himmler, Merwin L. "An Analysis and Evaluation of a Television Demonstration of the Teaching of Fifth-Grade Reading, Arithmetic, and French," Pittsburgh Schools, XXXI (March - June, 1957), 129-86.

A television demonstration of the day-to-day teaching of fifth-grade reading, arithmetic, and French in 16 Pittsburgh city and area schools was analyzed and evaluated. Comparisons were made between 20 TV classes (experimental) and 19 nonTV classes (control) for reading and arithmetic. Identical textbooks, courses of study, dictionaries, workbooks, and time allotments were used for the experimental and control classes. Data were gathered from intelligence tests given at the beginning of the term and standardized achievement tests administered at the beginning and end of the term. Separate matched groups in reading and in arithmetic were drawn up on the basis of these scores. A teacher-made French test was administered over television at the end of the term. Five questionnaires were designed and administered throughout the term to obtain observations and reactions from teachers, pupils, parents, and principals. Analysis was made of questionnaire responses and of pre- and post-test data for the matched groups. Details concerning teaching materials, time arrangements, selection of teachers, organization of TV teaching, and teaching methods are given. It is concluded that there may be little observable difference between the instructional effectiveness of TV teaching and regular classroom teaching, although the control group had significantly higher grade equivalent scores in reading and arithmetic. A detailed discussion of the findings and their implications is given. Tables and a bibliography are included.

4245
Holowinsky, Ivan. "The Relationship Between Intelligence (80-110 I.Q.) and Achievement in Basic Educational Skills," Training School Bulletin, 58 (May, 1961), 14-21.

The hypothesis that all students within the ranges of the dull-normal and average intelligence are equally able to master basic educational skills was investigated. Fifteen groups of 25 students each, 12-17 years of age and within the 80-110 IQ range, were selected and organized into five larger groups according to age level and three groups according to IQ level. The following tests were administered: the Otis Quick Scoring Mental Ability Test, Beta and Gamma forms; the California Reading Test, form AA; and the arithmetic part of the Wide Range Achievement Test. Data were collected on (1) achievement in reading at various IQ and age levels, (2) achievement in arithmetic at various IQ and age levels, (3) relationships between achievement in reading and arithmetic, (4) relationships between grade placement and educational achievement, and (5) the top grade levels which these students attained depending upon their IQ or mental potential. A moderately high relationship between IQ and reading, which varied depending upon age level, was shown. Considering the narrow IQ range studied (80-110), striking differences of achievement were found. Only a very moderate relationship between IQ and arithmetic was apparent. No appreciable difference was found in the average achievement of boys and girls. The significance and implications of the findings are discussed. Tables are included.

3630
Johnson, Donovan A. "The Readability of Mathematics Books," Mathematics Teacher, L (February, 1957), 105-10.

Eighteen mathematics books used as texts or supplementary books in the secondary school were analyzed. Previous findings concerning the readability of mathematics textbooks and the application of the Dale-Chall and Flesch readability formulas are discussed. Data are given for the readability level of three seventh-grade arithmetic texts, three eighth-grade arithmetic texts, two elementary algebra texts, three plane geometry texts, and seven supplementary mathematics books, as determined by the revised Flesch Reading Ease Scale. The seventh- and eighth-grade books were more difficult than the grade level for which they were intended, while the algebra books were approximately the right level. The geometry texts were at or below the grade for which they were written. A wide variety of reading levels (grades 8 to 15) was found in the supplementary books. Similar findings in a study by Thompson are reported. A recommendation for careful consideration of readability scores in the selection of mathematics texts is made. References and tables are included.

3118
Johnson, Mary E. "The Vocabulary Difficulty of Content Subjects in Grade Five," Elementary English, XXIX (May, 1952), 277-80.

The understanding of vocabulary in six content fields--arithmetic, geography, history, science, health, and literature--by fifth-grade children in the towns of Hampton and Phoebus, Virginia, was studied. A vocabulary test of 150 multiple-choice items using from one to five meanings per word was constructed from a list of 1,500 fairly difficult words found in fifth-grade textbooks. Words used in the test were checked against the Thorndike List of 30,000 words and against Luella Cole's Technical Vocabulary List. After a preliminary tryout, the test was revised and administered to 684 fifth-grade pupils. The data were analyzed for number of correct responses on each item, relative order of difficulty of the six subject matter areas. It was concluded from the test results that a program of word enrichment was needed for the understanding of textbooks used in the content subjects because the pupils tested did not seem to be equipped to deal with the vocabularies of the various fields. Tables and references are given.

4425
Kamii, Constance K., and Weikart, David P. "Marks, Achievement, and Intelligence of Seventh Graders Who Were Retained (Non-Promoted) Once in Elementary School," Journal of Educational Research, 56 (May-June, 1963), 452-59.

A study of non-promotion was made in Ypsilanti, Michigan, using seventh graders in two junior high schools as subjects. A group of 31 pupils who were retained once prior to sixth grade were described and compared with a random sample of 31 pupils who had never been retained. Marks, achievement levels, and intelligence test scores were studied. The retained pupils had marks in academic subjects that were significantly below the average of the regularly promoted seventh graders. Their achievement levels in reading and arithmetic and their I.Q.'s were significantly lower, although more than half of the low achievers had at least average intelligence. Different teaching methods, aimed at enhancing positive motivation and better social and personal adjustment, are suggested as a more effective solution than retention. Further research is necessary to determine what kinds of pupils benefit from retention before educators can justifiably retain pupils of elementary school age. Tables and references are included.

4093
Kerfoot, James F. "The Vocabulary in Primary Arithmetic Texts," The Reading Teacher, XIV (January, 1961), 177-80.

The problem of vocabulary in arithmetic texts is reviewed. Arithmetic word lists for the first and second grades were compiled, and six arithmetic textbook series were examined to determine which words appeared so frequently as to be considered basic. A list of words which appeared in at least three textbooks and had a total frequency of ten or above was developed. To determine vocabulary difficulty, each word in the list was checked with two lists of words considered easy for children, the Dale List of 769 Easy Words, and the revised Gates List of Vocabulary for the Primary Grades. A list of 49 words, which appeared in either the Gates or Dale list was compiled for the first grade. A second-grade list of 370 words was developed, and sixty-two of these words did not appear in either the Gates list or the Dale list. A reference and the word lists are included.

6388
Kingston, A.J. (Ed.) "Research for the Classroom: Content Textbook--Help or Hindrance?" By W. Hill. Journal of Reading, 10 (1967), 408-13.

Research is cited to indicate the formidable reading-learning task presented by the American content area textbook. Criticism refers to the density of concepts, the difficult vocabulary, and the generalized impersonal style of presentation. Texts in mathematics, science, and history have specific problems in readability. Favorable results from modification through re-writing and creative teaching are cited. The evidence gained from research and experimental teaching tends to confirm the contention that the content area textbook, as traditionally used, probably is a real hindrance to the student as a tool for learning. A systematic program of instruction is urged for the development of comprehension-study skills for more successful mastery of all content area textbooks. A bibliography is offered.

3123
Kohler, Richard C. "Use of Arts Activities with Reading, Science, and Arithmetic," Elementary School Journal, LII (February, 1952), 355-59.

A critical analysis of the types of arts activities recommended by textbook writers for use in the teaching of reading, science, and arithmetic is reported. The analysis revealed that 37 types of activities were recommended for integration of the selected subjects. A distribution of types of activities by grades indicated that 11 types of arts activities were common to all three curriculum areas. Nine types were exclusive to reading and three types to science. None appeared exclusively with the arithmetic program. Findings indicate that a greater variety of types was adaptable to the teaching of reading and science than for the teaching of arithmetic. More different types of activities were suitable for integrated teaching at the primary level than at the upper elementary level. The implications of the study are discussed.

5542
Langston, Genevieve Reitzell. "A Study of the Effect of Certain Structured Experiences in Science, Social Science, and Mathematics on Beginning Reading in Gifted Five Year Olds," Ph.D., University of Illinois, 1964. XXV, No. 2, 1049. (Order No. 64-8405, Microfilm $2.75; Xerography $7.80, 167 pages.)

The effect of 77 reading lessons (Richards and Gibson Methodology) and certain structured experiences in the content areas of mathematics, social science, and science on the oral reading, word knowledge, and word discrimination ability of a group of 48 gifted five-year-old children was investigated. The total group was divided into a control and an experimental group. Both groups were given the reading lessons. Only the experimental group was subjected to the structured experiences in the content areas. Gray's Oral Reading Paragraphs and the Metropolitan Achievement Test were the tests used. The statistical techniques included the use of the Chi Square test, z-scores, and Spearman's coefficient of rank correlation. There were no significant differences in oral reading, silent reading of both sentences and paragraphs, word knowledge, or word discrimination.

3525
Lanton, Wendell Cuthbert. "Comparison of the Reading, Arithmetic, Spelling Achievement of Third and Fifth Grade Pupils in 1953 and in 1934," Dissertation Abstracts XIV (No. 10, 1954). See also The Past-Present Achievement of Evanston School Children. NEA Research Division, National Education Association of the United States, Washington, D.C., September, 1954.

An investigation to determine how a group of elementary school children compared in 1953 in achievement with children of approximately two decades ago is reported. Achievement in reading, arithmetic, and spelling of 1290 pupils from selected elementary schools in Evanston, Illinois, was measured by the 1933 edition of the Metropolitan Achievement Tests, and scores were compared with those obtained by the same number of pupils in 1934. Comparisons were made by subgroups according to sex, grade, school, and subtest. Results show that the third- and fifth-grade pupils achieved higher scores on standardized educational tests administered in 1953 than did comparable groups tested in the same way in 1934. It is suggested that educational attainment has not deteriorated in the past 20 years.

5550
Lichter, Solomon Sidney. "Achievement in Reading and Arithmetic of the Pupils in a Junior High School as It is Affected by the Development and Use of a Behavioral Change Process," Ed.D., New York University, 1964.

Chairman: John C. Robertson, Vol. XXV, No. 2, 1049-1050. (Order No. 64-8478, Microfilm $2.75; Xerography $8.60, 188 pages.)

The effect of the behavioral change process on the reading and arithmetic achievement of seventh-grade pupils was investigated. Tests and other instruments used in the study included the principals' questionnaire, the teachers' observation form, standardized achievement tests in arithmetic and reading, and standardized intelligence tests. The analysis of covariance was the statistical technique used in the study. The author states in his list of major findings that achievement scores in reading and arithmetic of seventh-grade students involved in this study reflected no significant gains.

5196
Long, Barbara H., and Henderson, E.H. "Originality, Reading, and Arithmetic," Perceptual and Motor Skills, 21 (1965), 553-54.

A study was conducted to determine whether the imagination of a highly original child would contribute to his interest in reading and to his ability to hypothesize plot development, yet hinder his ability to solve arithmetic problems. Tolerance's Parallel Lines Test (1962), a non-verbal test of creativity, was given to 111 pupils. The 15 highest scoring boys and 15 highest scoring girls were selected to form the "original" group. The 15 lowest scoring boys and 15 lowest scoring girls were selected to form the "non-original" group. The reading and arithmetic scores from the Iowa Tests of Basic Skills of the both groups were examined. Analysis of variance revealed an effect for I.Q. (Otis) and an interaction between originality, reading, and arithmetic. References are given.

3637
Lynn, R. "The Temperamental Characteristics Related to Disparity of Attainment in Reading and Arithmetic," British Journal of Educational Psychology, XXVII (February, 1957), 62-67.

The results of an investigation of the relation of levels of attainment in reading and arithmetic to temperamental characteristics, especially feelings of anxiety, are reported. Previous studies suggested the hypothesis that there was general relationship between anxiety, good reading, and arithmetic. The relation of anxiety to reading-arithmetic disparity was studied among: (a) a group of 80 unselected normal boys and girls attending a primary school and (b) 45 normal boys attending a secondary modern school. All were given appropriate forms of the Schonell Graded Reading Test, attainment tests in arithmetic, and anxiety tests. A disparity score was derived by subtracting the arithmetic age from the reading age. The results of the anxiety tests and their relation to attainment disparity are given. In both groups there was a tendency for anxious children to be better in reading than in arithmetic. For primary children the relation of anxiety to attainment disparity was significant at the 5 percent level. This tendency might be due to the greater amount of time which anxious children spend on reading as a way of dealing with their anxieties. Several hypotheses for further research are suggested. A bibliography and tables are included.

3871
Lynn, R. "Disparity of Attainment in Reading and Arithmetic," British Journal of Educational Psychology, XXVIII (November, 1958), 277-80.

A discussion of the disparity of attainment in reading and arithmetic is reported. The criticisms of Reed and Schonfield are considered. Interpretations of studies concerned with the relationship between anxiety and good verbal ability in relation to perceptual and performance ability are discussed. References are included.

3237
Malter, Morton S. "Studies of the Effectiveness of Graphic Materials," Journal of Educational Research, XLVI (December, 1952), 263-73.

Ten studies concerned with the relative effectiveness of various types of graphic materials are reviewed. A table presents the following information about each of the studies: author, the year of the report, purpose, the number of pupils tested, grade level tested, materials employed, and method of presenting the materials. In seven of the studies, no attempt was made to teach graphic interpretation during the course of the investigation. A bibliography of the 10 studies reviewed is included.

6417
McCreary, J.R. "Reading Tests with Maori Children," New Zealand Journal of Educational Studies, 1 (1966), 40-50.

The difficulties of Maori children in reading and understanding written English were investigated by giving a battery of tests to all children above Standard 2 at the local Maori school. The A.C.E.R. Tests standardized for New Zealanders were administered in 1958. The same tests and the Otis Intelligence Tests were given again in 1961. The A.C.E.R. Tests consisted of Word Knowledge, Speed of Reading, Reading for Meaning, Oral Word Reading, and Arithmetic. All tests were given by the classroom teachers as part of the daily classroom routine. Scoring was done for attainment groups for each chronological age. Median raw scores were computed for each class. The median assessed as the upper limit of the fifth attainment group served as the pakeha norms with which Maori performance was compared. Results were based on the performance of 43 Maori children in 1958 and 57 Maori children in 1961. It was found that Maori children start with a language handicap when they enter a pakeha educational system. They are most handicapped in word knowledge and understanding printed English. They recognize words, but fail to grasp the meaning of words. The problem was greater in reading and understanding than in arithmetic. It is recommended that learning situations which allow learning words in a wide variety of contexts be provided.

6437
Morris, J.L., Pestaner, Mariana, and Nelson, A. "Mobility and Achievement," Journal of Experimental Education, 35 (1967), 74-80.

A study of the effect of mobility on reading and arithmetic achievement involved 410 Caucasian fifth-graders in northern Alameda County, California. Information on I.Q., reading and arithmetic achievement scores, the number of schools attended, and the socioeconomic status of the family was obtained for each child. The subjects were divided into three groups according to the number of schools attended. The distribution of scores in reading and arithmetic was also divided into thirds, and the frequency of occurrence of scores for students differing in mobility was calculated. Results presented in four tables indicate that variation in the reading scores, but not in the arithmetic scores of mobile children was greater than the variation for non-mobile children. However, when the mean reading and arithmetic scores of both groups were compared, no statistically significant difference was observed. This study showed that mobility has an effect on reading achievement but not on arithmetic achievement. However, personality variables were not considered.

5244
Perrodin, A.F., and Snipes, W.T. "The Relationship of Mobility to Achievement in Reading, Arithmetic, and Language in Selected Georgia Elementary Schools," Journal of Educational Research, 59 (1966), 315-19.

The relationship between mobility and pupil achievement in reading, arithmetic, and language at the sixth-grade level in selected Georgia elementary schools was studied. Subjects were 483 sixth-grade pupils in six elementary schools in a central Georgia county school system. Data were obtained from the California Short-Form Test of Mental Maturity (Form S), California Achievement Tests Complete Battery (Form W), and a Personal Data Form. Mobility was determined by number, recency, and distance of moves. The subjects were grouped according to sex, age, socio-education as determined by the Hollingshead Two Factor Index of

Social Position, retention, and I.Q. Means were calculated for each category. The findings are presented in tabular form and are discussed in detail. Conclusions concerning the relationships between mobility and the other factors investigated are given. Recommendations for further study are made. References are included.

3244
Perry, Dallis K. "Speed and Accuracy of Reading Arabic and Roman Numerals," Journal of Applied Psychology, XXXVI (October, 1952), 346-47.

Arabic and Roman numerals were compared to determine how much faster and more accurately Arabic numerals are read than Roman numerals. Thirty senior and graduate students at the University of Minnesota were given sets of numbers from 1-9, 10-49, and 50-99 in both Arabic and Roman numerals with directions to read them as fast and as accurately as possible. Measurements of speed and errors were taken. Arabic numbers were read much more quickly and accurately than Roman numerals in each of the three sets of numbers. The differences increased as the number grew larger. All differences were significant at the .01 level except the difference in errors for the 1-9 set of numbers. It was concluded that Arabic numerals are more desirable than Roman numerals for most reading purposes.

3983
Pidgeon, D.A. "A National Survey of the Ability and Attainment of Children at Three Age Levels," British Journal of Educational Psychology, XXX (June, 1960), 124-33.

The abilities and attainments of representative samples of children in England and Wales were surveyed. The age groups of the children tested were 7+, 10+, and 14+. All schools in the sample were grant-aided. The seven- and 14-year-olds were tested in October; the 10-year-olds were tested in May. The sampling procedure and tests administered are described. Mean standardized scores were used to analyze the data. There was overlap in performance between age groups as well as between modern and grammar schools. Girls had higher mean scores in mechanical arithmetic than boys. Urban children were superior in achievement to rural children. A bibliography and tables are included.

3245
Pitts, Raymond J. "Relationship Between Functional Competence in Mathematics and Reading Grade Levels, Mental Ability, and Age," Journal of Educational Psychology, XLIII (December, 1952), 486-92.

A study was conducted (1) to determine the interrelationship of functional competence in mathematics, reading grade levels, mental ability, and chronological age, and (2) to determine the relationship of each variable with the functional competence score when other variables are partialled out. Tests administered to 210 eleventh-grade girls enrolled in 17 accredited Negro high schools in Georgia were the Davis Test of Functional Competence in Mathematics, Experimental Edition, the Iowa Silent Reading Tests, Form Am, Advanced, and the Otis Quick-Scoring Mental Ability Test, Gamma Test Form Am. Reading levels, Gamma I.Q.'s, and chronological age were correlated with total scores on the Davis test and intercorrelated with each other. Reading levels and the Gamma I.Q.'s showed the highest correlation. Scores obtained on the Davis test correlated significantly with reading levels. All three sets of measures correlated negatively with age. Scores on the Davis test and Gamma I.Q.'s were not significantly correlated when reading levels and age were partialled out. Seven references are given.

3249
Preston, Ralph C., and Botel, Morton. "The Relation of Reading Skill and Other Factors to the Academic Achievement of 2,048 College Students," Journal of Experimental Education, XX (June, 1952), 363-71.

The extent to which reading skill, college aptitude, maturation, and remedial reading experience are related to college achievement was investigated. The subjects were 2,048 college students who entered the Wharton School of Finance and Commerce of the University of Pennsylvania from 1938 through 1945. Measures included the Iowa Silent Reading Test (ISRT), Form Am, the Scholastic Aptitude Test, the mean of grade points earned, and veteran status. Also, 15 students in the lowest tenth of their respective classes in reading scores received remedial instruction in the University's Reading Clinic. Low relationships were reported between college achievement and reading skill, college aptitude, and maturity, but remedial reading instruction yielded gains approaching significance. The unreliability of college grades and the validity of the ISRT are discussed, and figures and tables are included.

3885
Reed, Graham and Schonfield, David. "Disparity of Attainment in Reading and Arithmetic," British Journal of Educational Psychology, XXVIII (November, 1958), 271-76.

A critical analysis of an article by Dr. R. Lynn (The British Journal of Educational Psychology, February, 1957) which concluded that anxiety is a cause of good reading but interferes with progress in arithmetic is presented. Specific errors are noted in a detailed examination of Lynn's review of literature, of his materials and methods of investigation, and of his interpretation of results. It is concluded that the following weaknesses in Lynn's paper seem to invalidate his arguments: (1) confusion in use of clinical terms, (2) careless interpretation and incorrect quotation of the literature, and (3) dubious value of experimental procedures and errors in statistical computation. It was suggested that Lynn's imaginative approach be utilized for future investigation. Other suggestions for future investigations are made. Extensive references and a table are included.

5618
Reed, Mary Katherine Stevens. "Vocabulary Load of Certain State-Adopted Mathematics Textbooks, Grades One Through Three," Ed.D., University of Southern California, 1965. Chairman: Brown, Vol. XXVI, No. 7, 3706. (Order No. 65-12,264, Microfilm $3.40; Xerography $11.95, 261 pages.)

The vocabulary of California state-adopted mathematics programs for grades one through three was analyzed to determine the actual technical and supporting vocabularies introduced at each grade level, the extent of agreement between these and the vocabularies introduced in the state-adopted basic readers at the same grade levels, and the extent of agreement between the math vocabularies and those contained in certain standard word lists. Two master lists were constructed at each grade level. One list consisted of all technical words introduced and the other consisted of all supporting words. The lists were checked against two state-adopted basic reader series, against words contained in Dale's "List of 3,000 Familiar Words," Dolch's "Basic Sight Vocabulary," and Dolch's "First Thousand Words for Children's Reading." Further analysis of the frequency of selected letters of the alphabet was also carried out. Little agreement was found between the vocabularies of the state-adopted mathematics and the state-adopted basic reading series. Greater agreement existed between math test vocabularies and the three standard word lists. The frequency of selected letters was also reported. Recommendations indicated by the findings and conclusions are included.

3345
Russell, David H. "The Dimensions of Children's Meaning Vocabularies in Grades Four Through Twelve," University of California Publications in Education, Vol. 11, No. 5, pp. 315-414. Berkeley and Los Angeles, Calif.: University of California Press, 1954.

An investigation of the depth, breadth, and height of the meaning vocabularies of children in fourth through twelfth grades is reported. Breadth of vocabulary was studied in terms of wide-range sampling from science, social studies, mathematics, hobbies and recreations, and also in terms of the number of meanings associated with some words that have multiple meanings. Depth was examined by going beyond the superficial recognition of a synonym to some measure of how much the child understands about certain words. Height of vocabularies was investigated not in terms of total size, but in terms of development from year to year for the 9 years in the study. The book-length study covers the following areas: problems in vocabulary development, sources of research materials on vocabulary and concept development, research in vocabulary development, vocabulary tests of some diagnostic value, problems in vocabulary testing, verbal factors, concept development in childhood and adolescence, the work of Piaget, factors affecting concept and vocabulary development, procedures used in the study, test scores, answers to questions, factor analysis, and conclusions. Appendixes give sample pages from vocabulary tests and tables showing the results of statistical analyses. A bibliography is included.

4494
Scott, Carrie M. "The Relationships Between Intelligence Quotients and Gain in Reading Achievement with Arithmetic Reasoning, Social Studies, and Science," Journal of Educational Research, 56 (February, 1963), 322-26.

The relationship between I.Q. and achievement in various subject areas was studied. Increased reading ability was examined to detect gains in other areas of achievement. Three groups totalling 670 pupils for whom I.Q. data and the results of the Stanford Achievement Test were available were selected for the study. Grade scores were arranged to compare with national norms. The Pearson-Product-Moment Formula correlation was used between the intelligence and achievement scores. The findings indicated variations in the amount of gain as measured by the achievement tests, inconsistencies in gains on subtests, achievement test scores above national norms, highest correlation of I.Q. with arithmetic and lowest correlation with science, highest correlation of gain in reading with gain in social studies and lowest with gain in science, and positive correlation between reading gain and gains in other content areas. Tables and references are given.

4144
Smilansky, Sarah. "Evaluation of Early Education, in Kindergarten and Grades I and II of Elementary School," UNESCO Educational Studies and Documents, No. 42. Paris: UNESCO, 1961. pp. 8-17.

Early education in kindergarten and grades 1 and 2 of elementary school in Israel was evaluated. The study concerned all the children of the first and second grades in a heterogeneous community and 5- and 6-year-olds in all the kindergartens. This gave a total of 446 children of whom 213 were in eight school classes and 233 in 12 kindergarten classes. The subjects were grouped according to the socio-cultural background of their parents. Group A were children of parents who had come to Israel from culturally advanced countries, and Group B were children whose parents had immigrated from underdeveloped countries. Data were gathered from controlled observations of kindergarten activities, evaluations of the children's development by kindergarten teachers, individual examinations of each child by means of intelligence tests, and interviews with the families. A group of individual tests was administered to each child. The results of the Wechsler Intelligence Scale are summarized. Significant differences were found between the groups at the end of grades 1 and 2. Although kindergarten offered most of the children an environment much more congenial than provided by the home, the program evidently had not adjusted to the guided development of intellectual powers. Reasons for this failure are explained. Suggestions for kindergarten improvement are summarized. Tables are included.

5665
Snipes, Walter Thomas. "An Analysis of the Relationship of Mobility to Pupil Achievement in Reading, Arithmetic, and Language in Selected Georgia Elementary Schools," Ed.D., University of Georgia, 1964. Director: Alex F. Perodin, XXV, Vol. 5, 2819-2820. (Order No. 64-11,721, Microfilm $2.75; Xerography $7.40, 160 pages.)

The relationship between mobility and achievement in reading, arithmetic, and language was studied in a sixth-grade population of 483 students. The instruments used to determine achievement were the California Short-Form Test of Mental Maturity, Form S; the California Achievement Tests Complete Battery, Form W; and Personal Data Form and the Hollingshead Two Factor Index of Social Position. Analysis of variance was used to analyze the main scores derived when the categories of mobility, sex, socio-education, retention, and I.Q. were established in relation to achievement areas. The statistical findings showed that no significant differences existed among the compared groups in the six achievement areas and the mobility-variables except in the case of arithmetic fundamentals and number of moves. In this case, the differences favored those pupils who had moved the greatest number of times.

4153
Spencer, Peter L., and Russell, David H. "Reading in Arithmetic," Instruction in Arithmetic. National Council of Teachers of Mathematics Yearbook, XXV (1960), 202-23.

The role of reading in arithmetic is discussed. The nature of mathematical reading is distinguished from the nature of conventional reading. Common sources of difficulty in mathematical reading are examined. Also included is a survey of research on arithmetic and general reading ability, arithmetic and vocabulary, and arithmetic and specific reading skills. Suggestions for teachers to help students read verbal arithmetic problems are given. Forty-eight sources are listed in the bibliography.

6502
Stauffer, R.G. "A Vocabulary Study Comparing Reading, Arithmetic, Health and Science Texts," The Reading Teacher, 20 (1966), 141-47.

In order to compare vocabularies in basal readers and textbooks in three content areas, four separate word counts were made on seven basic reading series and three textbook series each for science, health, and arithmetic. Word counts were done by education students at the University of Delaware. In reading, words presented for the first time were counted, including variants, compounds, and contractions. In the content areas, every different word in each text was counted, including variants, compounds, and contractions. From these 16 lists, a master vocabulary was derived for each of the four areas. Words were assigned to the level where the greatest number of introductions occurred. Total word counts at different levels were determined, and intralevel and interlevel comparisons were made. Tabulated results show grade level distributions of different words, common words, overlap of vocabularies, and reading words found in content areas materials. These results revealed very little overlap of vocabularies between the series in reading and the three content areas, indicating a lack of uniform vocabulary usage in the four areas. A program of word attack skills which emphasizes meaning and phonetic-structural attack and allows students to read independently in different subject matter areas is needed. Word counts were based on books for the primary level.

5679
Stull, Lorren LaMar. "Auditory Assistance of Reading as a Factor in Intermediate Grade Pupils' Interpretations of Verbal Arithmetic Problems," Ed.D., The Pennsylvania State University, 1964. Vol. XXV, No. 12, Part I, 7113. (Order No. 65-4424, Microfilm $2.75; Xerography $7.40, 159 pages.)

The effect of auditory assistance on intermediate grade children's ability to take an arithmetic verbal-problems test was investigated. The subjects were 838 fourth-, fifth-, and sixth-grade children located in five central Pennsylvania school districts. In each district, one class of each intermediate grade received auditory reading assistance; an equivalent class at each grade level received no assistance during the same verbal-problems test. The auditory assistance in this case consisted of tapes of each problem played to the children while they read silently. The test administered to the groups was the RASP Test developed by C.G. Corle and M.L. Coulter as part of their reading and arithmetic program. Two- and three-factor analysis of variance techniques were the statistics used. The author states that in only one instance did the provision of auditory reading assistance work effectively to produce higher scores on a verbal problem test. The exception occurred on the sub-test which measured ability to recognize missing and unavailable information. Also, there were sex differences in scores on sub-tests: (1) knowledge of quantitative relationship requiring social understandings, (2) ability to recognize missing and unavailable information, and (3) ability to read precisely, refusing to be misled by distractors.

4013
Tinker, Miles A. "Legibility of Mathematical Tables," Journal of Applied Psychology, XLIV (April, 1960), 83-87.

The effect of type size, arrangement of numerals in columns, and space vs. space plus a rule between columns on the speed of locating powers and roots in mathematical tables was investigated. Five-column tables were printed so that the variables could be studied one at a time. Nine studies were completed with 24 to 30 subjects in each, a total of 246 college students. Each subject was asked to find and cross out the squares, cubes, square roots, or cube roots as quickly as possible when a number was presented to him. All testing was done individually under 25 ft-c of well diffused illumination in the Minnesota Light Laboratory. The results of the t test for related measures are reported in nine tables. Apparently the most favorable factor in determining the quick finding of powers and roots in tables was the grouping of numerals in the columns. Grouping by fives appeared slightly better than by 10's for both the 6- and 8-point type. There seemed to be a slight advantage for 1 pica space plus a rule between columns, but the results were not entirely unequivocal.

3461
Tinker, Miles A. "Readability of Mathematical Tables," Journal of Applied Psychology, XXXVIII (December, 1954), 436-42.

The comparative readability of 5 mathematical tables in terms of the speed with which subjects can find the squares, square roots, and cube roots of numbers was studied. Tables were chosen which permitted comparisons between type sizes, type faces, and the arrangement of columns and rows of numerals. One hundred twenty university students were selected as subjects. The time required for the subjects to look up squares, square roots, and cube roots in the various books was measured when subjects started with page 1 of the tables and when the page containing the number sought was given. The numbers sought were found considerably faster when subjects were given the appropriate page numbers. Certain typographical factors which promoted more effective readability were discovered. A list of recommendations for an effective typographical arrangement for mathematical tables is given. References and tables are included.

3366
Traxler, Arthur E., and Townsend, Agatha. "Relationship of Differences Between Verbal and Numerical Aptitude to Differences in Achievement in English and Mathematics," 1953 Achievement Testing Program in Independent Schools and Supplementary Studies, Educational Records Bulletin No. 61, pp. 61-65. New York: Educational Records Bureau, July, 1953.

In order to obtain information concerning the value of differences between scholastic aptitude test scores for predicting differences in achievement, the differences between the standard scores of independent school eighth-grade pupils on the Junior Scholastic Aptitude Test were correlated with differences between the standard scores of these pupils on several achievement tests. The reading, language usage, and arithmetic tests of the Stanford Achievement Test, Advanced Battery, Form G, the Cooperative English Test, Test A, Mechanics of Expressions, Test C1, Reading Comprehension, Form S, and the Cooperative Elementary Algebra Test, Form S, were used. All the correlations were positive. The correlation between English Test A scores and algebra scores was quite low, but the other correlations were substantial. There was definite evidence that differences between verbal and numerical scores have value for prediction of differences between the reading achievement and the mathematics achievement of individual pupils.

4342
Troxel, Vernon. "The Effects of Purpose on the Reading of Expository Mathematical Materials in Grade Eight," Journal of Educational Research, 55 (February, 1962), 221-27.

Relationships within and between measures of ability to read expository mathematical material and between each of these measures and measures of general reading ability and of arithmetic achievement were investigated. Two groups of eighth-grade students, equated on the basis of Iowa Silent Reading Tests scores, were asked to read 20 passages in a test on expository mathematical material constructed for the study. One exercise was completed on each of 20 consecutive school days. Group A, containing 22 students, was told to answer one specific question about each passage. Group C, containing 23 students, was told to find the main idea of each passage. The relationships between both the speed and accuracy scores and the arithmetic achievement scores were investigated by computing the coefficients of correlation, the corrected coefficients, and the partial coefficients. The t test was used to test the significance of the differences between the first-half and the last-half scores for all four sets of scores. The relationships between speed and accuracy for both groups were investigated by computing the coefficients of correlation. Results are shown in tabular form. It was indicated that the speed of reading is influenced by the purpose for reading and that the faster readers tend to be more accurate. Conclusions and references are offered.

5029
Vanderlinde, Louis F. "Does the Study of Quantitative Vocabulary Improve Problem-Solving?" Elementary School Journal, 65 (December, 1964), 143-52.

An experiment was conducted to determine the effects of a systematic, direct study of mathematical vocabulary on achievement in arithmetic problem-solving. All fifth-grade pupils in Bay City, Michigan, were given the Lorge-Thorndike Intelligence Test and four subtests of the Iowa Tests of Basic Skills for grades 3-9 (Vocabulary, Reading Comprehension, Arithmetic Concepts, Arithmetic Problem-Solving). Nine experimental classes (211 pupils) were matched with nine control groups (183 pupils) for achievement and intelligence. Control classes were given the regular instructional program in arithmetic. Experimental groups studied vocabulary 30 minutes per week as a part of their arithmetic study. At the end of the school year, students were given another form of the Iowa Tests. Significantly higher achievement on the post-tests of arithmetic problem-solving and concepts was shown by the experimental groups. Specific conclusions and suggestions for incorporating vocabulary direct-study techniques into the arithmetic curriculum are given. References and tables are included.

4530
Whitla, Dean K. "Effect of Tutoring on Scholastic Aptitude Test Scores," Personnel and Guidance Journal, 41 (September, 1962), 32-37.

The effects of tutoring 52 students for the preparation of the Scholastic Aptitude Test (SAT) were studied. The thesis was that the College Board Scholastic Aptitude Test scores could be increased by an intensive tutoring program designed specifically for this purpose. The course work consisted of five 2-hour sessions and intensive homework drill in vocabulary, reading skills, mathematical concepts, and dealing with multiple choice items. The experimental sample consisted of 52 students who were enrolled in the Reading Institute's program. The control sample was made up of students from one high school in a Boston suburb. The junior board of the SAT was used as a pretest for the experimental and control groups, and the SAT-M was used as a post-test. Statistical comparisons were made. Findings revealed that the tutoring of the 52 subjects did not have any significant effect on their SAT scores.

6653
Yeager, John L. "Measures of Learning Rates for Elementary School Students in Mathematics and Reading Under a Program of Individually Prescribed Instruction," University of Pittsburgh, Report Number BR-5-0253-Thesis-1. (Order No. ED 010 209, ERIC Document Reproduction Service, 4936 Fairmont Ave., Bethesda, Maryland, Microfiche $0.50; Hard Copy $3.68, 92 pages.)

The consistency of three measures of learning rate in mathematics and reading was studied over different units of study. Students of grades one through six (N=152) were assigned to a specific level in a content area based on subject mastery. The rate measures included the total number of mathematics and reading units mastered by a student, the number of days a student required to master a given unit, and an index of rate of learning. The results indicated that the rate of student learning, as measured, was specific to a given task, and not a general factor operating uniformly in all learning situations. Non-consistent student-learning rate was found between the curriculum areas of mathematics and reading for those rate measures pertaining to specific units. Finally, the level of reading achievement was not related to the rate of learning measures for specific units.

Supplementary References, 1900-1950

July 1, 1948 to June 30, 1949

2810
Cruickshank, William M. "Arithmetic Ability of Mentally Retarded Children. I. Ability to Differentiate Extraneous Materials from Needed Arithmetical Facts," Journal of Educational Research, XLII (November, 1948), 161-70.

Compares a mentally retarded group having an average C. A. of 14.29 and an M.A. of 10.06 with a control group having an average C. A. of 9.09 and an M. A. of 9.96.

2811
Cruickshank, William M. "Arithmetic Ability of Mentally Retarded Children. II. Understanding Arithmetic Processes," Journal of Educational Research, XLII (December, 1948), 279-88.

Compares a mentally retarded and a control group of fifteen boys each in ability to select while reading "the processes which should be employed in the solution of simple exercises in arithmetic."

July 1, 1947 to June 30, 1948

2722
Eagle, Edwin. "The Relationship of Certain Reading Abilities to Success in Mathematics," The Mathematics Teacher, XLI (April, 1948), 175-79.

Bases conclusions on correlations between a composite measure of success in mathematics and scores on tests of reading comprehension, reading speed, general vocabulary, mathematics vocabulary, and ability to interpret graphs and formulas.

July 1, 1946 to June 30, 1947

2761
Moore, E. A. "Reading and Arithmetic Abilities Associated with Speech Defects," Journal of Speech Disorders, XII (March, 1947), 85-86.

Compares the average reading scores of 236 ninth-grade pupils classed into the following groups on the basis of speech defects: articulatory; stuttering, voice, special organics; speech of the hard of hearing; speech of the feeble minded.

July 1, 1945 to June 30, 1946

2610
Traxler, Arthur E. "Reading and Secondary-School Achievement," 1946 Achievement Testing Program in Independent Schools and Supplementary Studies, pp. 58-63. Educational Records Bulletin No. 45, New York. Educational Records Bureau, June, 1946.

Presents correlations between scores on reading tests of independent school pupils and their scores in English expression, literature, mathematics, science, and history.

July 1, 1944 to June 30, 1945

2648
Hansen, Carl W. "Factors Associated with Successful Achievement in Problem Solving in Sixth Grade Arithmetic," Journal of Educational Research, XXXVIII (October, 1944), 111-18.

Presents evidence of the relation of six aspects of reading to ability to solve problems in sixth-grade arithmetic.

2503
Johnson, Harry C. "The Effect of Instruction in Mathematical Vocabulary Upon Problem Solving in Arithmetic," Journal of Educational Research, XXXVIII (October, 1944), 97-110.

Analyzes data from 898 pupils in 28 seventh-grade classes "to determine whether improvement in specific mathematical vocabulary leads to an improvement in the solution of problems which involve the use of these specific mathematical terms."

2538
Treacy, John P. "The Relationship of Reading Skills to the Ability to Solve Arithmetic Problems," _Journal of Educational Research_, XXXVIII (October, 1944), 86-96.

Bases conclusions on data from 244 seventh-grade pupils.

2541
Wheat, Harry Grove. Studies in Arithmetic. A Summary of Masters' Problems and Theses Dealing with the Subject of Arithmetic, West Virginia University, 1936-1944, Chapter V. Morgantown, West Virginia. Office of the President, West Virginia University, March, 1945.

Summarizes the findings of two masters' theses at the University of West Virginia, one relating to the vocabulary of a third-grade textbook, and the other relating to the command of mathematical vocabulary of upper-grade pupils and the effect of exercises to improve their achievement.

2545
Woodrow, Herbert. "Intelligence and Improvement in School Subjects," _The Journal of Educational Psychology_, XXXVI (March, 1945), 155-66.

Reports the results of a study to determine whether ability to improve in six school skills or subject-matter areas (reading, vocabulary, arithmetic fundamentals, arithmetic problems, English and spelling) is synonymous with intelligence, and if not, if there is any general ability to improve manifested in the gains made.

July 1, 1943 to June 30, 1944

2422
Artley, A. Sterl. "A Study of Certain Relationships Existing Between General Reading Comprehension and Reading Comprehension in a Specific Subject-Matter Area," _Journal of Educational Research_, XXXVII (February, 1944), 464-73.

Presents correlations based on records secured from 242 eleventh-grade pupils.

July 1, 1941 to June 30, 1942

2251
McKim, Margaret Grace. _The Reading of Verbal Material in Ninth Grade Algebra_. Teachers College Contributions to Education No. 850, New York.

Teachers College, Columbia University, 1941.

Correlates the scores of 120 first-year algebra students on two tests "in reading typical explanatory material and problems in ninth grade algebra" with scores on standardized reading, mental ability, and algebra tests and final examinations.

July 1, 1940 to June 30, 1941

2101
Bond, Elden A. Tenth-Grade Abilities and Achievements. Teachers College Contributions to Education, No. 813. New York, Teachers College, Columbia University, 1940.

Reports interrelationships between tenth-grade abilities, such as intelligence, reading comprehension, reading speed, study skills, reading vocabulary, and scholastic achievements in English, history, geometry, and biology.

2112
Coffing, Esther A. "The Relationship Between Silent Reading Ability and Arithmetical Ability," School Science and Mathematics, XLI (January, 1941), 10-14.

Presents conclusions based on scores of 355 pupils in grades 4B to 8A on the paragraph meaning and arithmetic reasoning sections of the new Stanford Achievement Test.

2161
O'Rourke, Everett V., and Mead, Cyrus D. "Vocabulary Difficulties of Five Textbooks in Third-Grade Arithmetic," Elementary School Journal, XLI (May, 1941), 683-91.

Presents the results of a study to determine the number of running words, number of different words, average repetition of words, distribution of words according to placement on the Gates vocabulary test, classification of proper nouns, etc.

2188
Thompson, Ronald B. The Administration of a Program of Diagnosis and Remedial Instruction in Arithmetic, Reading, and Language Usage in Secondary School. Lincoln, Nebraska, Graduate College, University of Nebraska, 1940.

Presents evidence relative to the value of the program and suggests answers to specific questions relating to diagnostic and remedial teaching in high schools.

July 1, 1939 to June 30, 1940

1990
Drake, Richard M. "The Effect of Teaching the Vocabulary of Algebra," Journal of Educational Research, XXXIII (April, 1940), 601-10.

Presents the results of controlled experiments in various schools and classes to determine the effect on achievement in ninth-grade algebra of specific teaching the vocabulary of algebra.

July 1, 1938 to June 30, 1939

1854
Bond, Eva. Reading and Ninth Grade Achievement. Teachers College Contributions to Education, No. 756. New York, Teachers College, Columbia University, 1938.

Summarizes the results of a study among three hundred ninth-grade pupils to determine "the relationship between various reading skills and scholastic achievement in various subject matter areas."

1856
Clark, Mildred I. "The Effect of Remedial Work in Reading Comprehension Upon Algebraic Achievement," Mathematics Teacher, XXXII (February, 1939), 65-67.

Presents the results of a controlled experiment to determine the effect upon achievement in algebra of remedial instruction in reading provided for a group of ninth-grade pupils.

1944
Stright, Isaac L. "The Relation of Reading Comprehension and Efficient Methods of Study to Skill in Solving Algebraic Problems," Mathematics Teacher, XXXI (December, 1938), 368-72.

Reports an experiment involving seventy high school freshmen to determine relation of reading comprehension to algebraic skill, and effectiveness of specific training in reading and study on improvement in these two capacities.

July 1, 1937 to June 30, 1938

1745
Bennett, H. K. "A Remedial Program in Reading Involving the Development of the Basic Study Skills and Their Application to the Content Subjects,"

Circular No. 78, Des Moines, Iowa, State Department of Public Instruction, 1937, pp. 28. (Mimeographed).

Presents the results of a remedial-reading program in grades 5 to 8, inclusive, and outlines a pattern for a remedial program in work-type reading.

1771
Goforth, Lillian. "A Classroom Experiment in Teaching Reading and Arithmetic Through Games," Educational Method, XVII (February, 1938), 231-35.

Presents objective evidence of the results secured in teaching reading through the use of the read-o series IA and IB in the second grade.

July 1, 1936 to June 30, 1937

1671
Edwards, A. S. "A Mathematics Vocabulary Test and Some Results of an Examination of University Freshmen," Journal of Educational Psychology, XXVII (December, 1936), 694-697.

Presents the results of a mathematics vocabulary test given to 166 freshmen at the University of Georgia who had had one or more university courses in mathematics. Also shown are the results of the same test given to 665 freshmen at the same university before they started any class work.

1693
Kanarik, Rosella, and Manwiller, C. E. "How a High School Attacks Its Learning Difficulties in Reading and Arithmetic," Pittsburgh Schools, XI (January-February, 1937), 94-116.

Describes the steps taken and the results secured in a diagnostic and remedial study among all pupils who entered 7B class in Langley High School, Pittsburgh. Considers the value of the telebinocular and the ophthalmograph in diagnosing pupil difficulties in reading.

1731
Wagner, Guy W. "The Maturation of Certain Visual Functions and the Relationship Between These Functions and Success in Reading and Arithmetic," Studies in Psychology of Reading, I, University of Iowa Studies in Psychology, No. 21. Psychological Monographs, Vol. XLVIII, No. 3, Princeton, New Jersey, Psychological Review Co., 1937, pp. 108-146.

Summarizes the results of the Betts Ready to Read Tests, of fusion, amplitude of fusion, lateral imbalance, visual acuity, and stereopsis given to approximately 850 pupils in the kindergarten and grades 1-6, inclusive, of the Syracuse, New York, Public Schools.

July 1, 1935 to June 30, 1936

1589
Gunderson, Agnes G. "Nature and Amount of Arithmetic in Readers for Grades 1 and 2," Elementary School Journal, XXXVI (March, 1936), 527-40.

Reports classified lists of terms and items related to arithmetic or quantitative concepts that are used in primers and first and second readers of ten series. Shows also their frequency of use.

July 1, 1934 to June 30, 1935

1454
Dresher, Richard. "Training in Mathematics Vocabulary," Educational Research Bulletin, XIII (November, 1934), 201-04.

Presents the results of an experiment including approximately 500 pupils to determine the value of extensive and specific vocabulary training in junior high school mathematics.

July 1, 1933 to June 30, 1934

1357
Cowley, Elizabeth B. "Technical Vocabularies for Plane and Solid Geometry," Journal of Educational Research, XXVII (January, 1934), 344-54.

Summarizes the results of (a) an examination and evaluation of three recent vocabularies for geometry, (b) discriminating word studies of six geometries, and (c) a questionnaire study of the understanding of high school pupils of words appearing frequently in geometry, and (d) studies of technical vocabularies for plane and solid geometry.

1393
Kramer, Grace A. The Effect of Certain Factors in the Verbal Arithmetic Problem Upon Children's Success in the Solution. Johns Hopkins University Studies in Education, No. 20. Baltimore: Johns Hopkins Press, 1933. pp. 106.

Summarizes the results of studies of the influence of interest, sentence, form, style (language detail) and vocabulary upon the success of sixth-grade children in solving verbal arithmetic problems.

1412
Scarf, R. C. "Special Disability in Reading and Arithmetic," Twentieth Annual Conference on Educational Measurements held at Indiana University April 14 and 15, 1933, Bulletin of the School of Education, Indiana University, Vol. X, No. 1. Bloomington, Indiana, Bureau of Cooperative Research, Indiana University School of Education, 1933, pp. 70-84.

Reports the results of differences in the achievement in reading and arithmetic of freshmen in a state teachers college and the findings in case studies of children from broken homes.

July 1, 1932 to June 30, 1933

1252
Brownell, William A. "The Growth and Nature of Research Interest in Arithmetic and Reading," Journal of Educational Research, XXVI (February, 1933), 429-41.

Analyzes data relative to the number and percent of investigations in reading and in arithmetic published during the last half century.

1269
Engelhart, Max D. "The Relative Contribution of Certain Factors to Individual Differences in Arithmetical Problem Solving Ability," Journal of Experimental Education, I (September, 1932), 19-27.

Reports the results of a study among 568 fifth-grade pupils to determine "the relative contributions of intelligence, computation ability, and reading ability to individual differences in arithmetical problem-solving ability."

1301
Monroe, Walter S., and Engelhart, Max D. "The Effectiveness of Systematic Instruction in Reading Verbal Problems in Arithmetic," Elementary School Journal, XXXIII (January, 1933), 377-81.

Summarizes the results of an experiment in the fifth grade to determine the relative merits of systematic versus incidental instruction in the reading of verbal problems.

1309
Pressey, L. C., and Elam, M.K. "The Fundamental Vocabulary of Elementary-School Arithmetic," Elementary School Journal, XXXIII (September, 1932), 46-50.

Selects from a list of more than one thousand technical words in arithmetic a fundamental vocabulary based on frequency, importance, and social usefulness.

1335
Woody, Clifford. Nature and Amount of Arithmetic in Types of Reading Material for the Elementary Schools. Bulletin of Bureau of Educational Reference and Research, No. 145. Ann Arbor, Michigan: School of Education, University of Michigan, pp. 80.

Reviews related studies and presents the results of analyses of books and materials assigned in grades 3 to 8 inclusive to determine the mathematical terms and concepts used.

July 1, 1931 to June 30, 1932

1186
Low, H. R. Relation of Reading Comprehension to Arithmetical Ability. Supplement to the Scottish Educational Journal, No. 6. Edinburgh, Scotland: Scottish Council for Research in Education, December, 1931. pp. 8.

Presents the results of experiments to determine to what extent ability in solving arithmetical problems is correlated with ability to comprehend the significance of printed matter.

1191
McCallister, James M. "Determining the Types of Reading in Studying Content Subjects," School Review, XL (February, 1932), 115-23.

Summarizes the results of observations and analyzes the materials and techniques of teaching junior-high-school history, mathematics, and general science to determine the types of reading required.

1201
Monroe, Walter S., and Engelhart, Max D. "Methods of Teaching Reading of Arithmetical Subject-Matter," A Critical Summary of Research Relating to the Teaching of Arithmetic, Bureau of Educational Research Bulletin No. 58, University of Illinois Bulletin, XXIX, No. 5. Urbana, Illinois: University of Illinois, 1931. pp. 76-80.

Summarizes studies relating to the reading of arithmetical subject matter.

1206
Pressey, L. C., and Moore, W. S. "The Growth of Mathematical Vocabulary from the Third Grade Through High School," School Review, XL (June, 1932), 449-54.

Presents the results of tests of meaning vocabulary in arithmetic, algebra, and geometry to determine growth through the grades.

1209
Rebert, G. Nevin. "A Laboratory Study of the Reading of Familiar Numerals," Journal of Educational Psychology, XXIII (January, 1932), 35-45.

Summarizes eye-movement records secured from 106 high-school and college subjects to determine "how familiar numerals are read when they appear in context."

1210
Rebert, G. Nevin. "A Laboratory Study of the Reading of Familiar Formulas," Journal of Educational Psychology, XXIII (March, 1932), 192-203.

Summarizes eye-movement records secured from 60 subjects to find out "how familiar formulas are read when they appear in verbal context."

1222
Stevens, B. A. "Problem Solving in Arithmetic," Journal of Educational Research, XXV (April-May, 1932), 253-60.

Discusses the relationship between scores in silent reading in the fundamentals of arithmetic, in reasoning problems in arithmetic, and in general intelligence for pupils in grades 3 to 7.

1241
Woody, Clifford. "Nature and Amount of Arithmetic in Types of Reading Material for the Elementary Schools," Educational Outlook, VI (May, 1932), 199-217.

Reports the results of an analysis of 12,944 pages of material in 38 textbooks and 9 magazines for use in grades 3 to 8.

July 1, 1930 to June 30, 1931

1016
Buswell, G. T., and John, Lenore. The Vocabulary of Arithmetic. Supplementary Educational Monographs, No. 38. Chicago: Department of Education, University of Chicago, 1931.

Presents a list of arithmetical terms commonly used in elementary grades and reports the results of studies in which children's reactions to selected terms were determined.

1073
McCallister, James M. "Reading Difficulties in Studying Content Subjects," Elementary School Journal, XXXI (November, 1930), 191-201.

Classifies according to underlying causes the reading difficulties encountered by pupils in grades 7 and 8 in studying American History, mathematics, and general science.

1074
McCallister, James M. "Guiding Pupils' Reading Activities in the Study of Content Subjects," Elementary School Journal, XXXI (December, 1930), 271-84.

Describes methods used in five types of guidance in reading in content subjects given to overcome specific difficulties.

July 1, 1929 to June 30, 1930

981
Shriner, Walter O. "The Reading Factor in Arithmetic," University of Michigan School of Education Bulletin, I (April, 1930), 107-8.

Summarizes the results of a study of 1,191 pupils to determine "the influence of drill in reading verbal problem exercises on ability to solve verbal problems in arithmetic."

July 1, 1928 to June 30, 1929

826
Georges, J. S. "The Nature of Difficulties Encountered in Reading Mathematics," School Review, XXXVII (March, 1929), 217-26.

Reports six types of difficulties encountered by pupils in studying mathematics and discusses their nature.

881
Tinker, Miles A. "How Formulae are Read," American Journal of Psychology, XL (July, 1928), 476-83.

Summarizes the results of a tachistoscopic study of five advanced students in psychology to determine significant facts about the reading of mathematical formulas.

882
Tinker, Miles A. "The Relative Legibility of the Letters, the Digits, and of Certain Mathematical Signs," Journal of General Psychology, I (July-October, 1928), 472-96.

Summarizes related investigations and reports the results of a short-exposure experiment to determine the legibility of the twenty-six letters, the digits, and several signs.

July 1, 1927 to June 30, 1928

685
Andrews, Frances Ethel. "The Relation Between Vocabulary Difficulties and Failures in High School Mathematics," Unpublished Master's Thesis, Department of Education, University of Chicago, 1927.

Reports the results of studies to determine the extent to which initial familiarity with the vocabulary of a textbook determines success or failure in a course in mathematics.

771
Swan, Mary A., Dines, Anna A., Kinley, Anna S., and Nieman, Ida J. "Arithmetical Vocabulary for First and Second Grades," Curriculum Study and Educational Research Bulletin (Pittsburgh Public Schools), II (September-October, 1927), 4-14.

Presents a classified list of words used in arithmetic in the first and second grades and shows the frequency with which they occur in several published word lists.

775
Tinker, Miles A. "Numerals Versus Words for Efficiency in Reading," Journal of Applied Psychology, XII (April, 1928), 190-99.

Reports the results of a study to determine whether the speed of reading is greater when printed numbers are read or when Arabic numerals are read.

July 1, 1926 to June 30, 1927

574
Baird, James. "Parallel Programs in Reading and Arithmetic." In Proceedings of the Ninth Annual Educational Conference, pp. 8-11. Research Bulletin No. 12 of the Detroit Educational Bulletin. Detroit, Michigan: Board of Education, 1927.

Presents the results of experiments in grades 4B to 8A to determine the value of "parallel programs in reading" in providing for individual needs.

625
Hunt, Ava Farwell. "A Comparison of the Vocabularies of Third-Grade Textbooks in Arithmetic and Reading." Unpublished Master's Thesis, Department of Education, University of Chicago, 1926.

Reports the results of a comparison of the vocabularies of six third-grade arithmetics and of ten third-grade readers to determine the number of common words and the number of technical words used.

670
Tinker, Miles A. "Reading Reactions for Mathematical Formulae," Journal of Experimental Psychology, IX (December, 1926), 444-67.

Presents the results of an experimental study of "the relative legibility of exponents and subscripts in mathematical formulae as compared to the same symbols when used in the body of such formulae."

July 1, 1925 to June 30, 1926

519
Brooks, S. S. "A Study of the Technical and Semi-Technical Vocabulary of Arithmetic," Educational Research Bulletin (Ohio State University), V (May 26, 1926), 219-22.

Presents in part the results of an analysis of the technical and semi-technical vocabularies in "five complete sets of representative arithmetic textbooks."

535
Gray, Olive. "Teaching Pupils to Read Arithmetic and Other Subject Matter," Elementary School Journal, XXVI (April, 1926), 607-18.

Emphasizes the importance of teaching pupils to read in content subjects and lists numerous words and expressions in various subjects which pupils should learn to recognize and interpret accurately.

545
McClure, Worth. "Learning to Read Arithmetic Problems," Teachers Journal and Abstract, I (March, 1926), 183-88.

Discusses the "specialized skills" that are essential in reading arithmetic problems intelligently as revealed by scientific studies.

550
Partridge, Clara Martin. "Number Needs in Children's Reading Activities," Elementary School Journal, XXVI (January, 1926), 357-66.

Reports an illuminating list of mathematical terms and concepts found in readers, geographies, histories, and language books.

555
Scarf, Robert C. "Mathematics Necessary for the Reading of Popular Science." Unpublished Master's Thesis, Department of Education, University of Chicago, 1925.

Reports the results of an analysis of scientific magazines, books on science, and scientific articles in popular magazines to determine the mathematical words and concepts needed in interpreting easy science material.

July 1, 1924 to June 30, 1925

464
Greene, Harry A. "Directed Drill in the Comprehension of Verbal Problems in Arithmetic," Journal of Educational Research, XI (January, 1925), 33-40.

Presents the results of an experiment in four sixth-grade sections to determine the value of training pupils "to select and recognize the processes involved in the solution" of problems in arithmetic.

471
Lessenger, W. E. "Reading Difficulties in Arithmetical Computation," Journal of Educational Research, XI (April, 1925), 287-91.

Reports the effect of nine months of specific training in reading arithmetic problems given to 111 pupils in grades 3 to 8, inclusive.

492
Stevenson, P. R. "Difficulties in Problem Solving," Journal of Educational Research, XI (February, 1925), 95-103.

Presents facts relative to six causes of failure in arithmetic, including inability to read and lack of general and technical vocabularies.

500
Turner, James M. "A Study of Vocabulary in Arithmetic," Educational Research Bulletin, III (October, 1924), 291-94. Columbus, Ohio: Bureau of Educational Research, Ohio State University.

Presents the results of an analysis of the vocabulary used in a series of arithmetic textbooks for grades 3, 4, 5, and 6.

1884 to June 30, 1924

152
Hackler, John Monore. "The Relation Between Successful Progress in Mathematics and the Ability to Read and Understand, and the Factors that Contribute to Success or Failure in Mathematics." Unpublished Master's Thesis, Department of Education, University of Chicago, 1921.

Presents correlations between progress in mathematics and ability to read in the case of high-school and elementary-school pupils. Discusses several case studies.

157
Harlan, Charles L. "Years in School and Achievements in Reading and Arithmetic," Journal of Educational Research, VIII (September, 1923), 145-49.

Discusses the relation of the amount of schooling and achievement in reading and arithmetic in the case of nine hundred pupils in grades 4 to 8, inclusive.

165
Henmon, V. A. C. "Improvement in School Subjects Throughout the School Year," Journal of Educational Research, I (February, 1920), 81-95.

Reports the improvement during a year in reading, writing, spelling, and arithmetic in grades 2 to 6, inclusive.

177
Hoover, J. H. "Motivated Drill Work in Third-Grade Arithmetic and Silent Reading," Journal of Educational Research, IV (October, 1921), 200-211.

Describes the results secured in thirty third-grade rooms through motivated drill work.

259
Merrill, Maud A. "The Ability of the Special Class Children in the 'Three R's,'" Pedagogical Seminary, XXV (March, 1918), 88-96.

Reports the results of reading, arithmetic, and handwriting tests given in special classes in Minnesota and in the Minnesota School for Feeble-Minded.

261
Merrill, Maud A. "The Relation of Intelligence to Ability in the 'Three R's' in the Case of Retarded Children," Pedagogical Seminary, XXVIII (September, 1921), 249-74.

Reports the results of an investigation among 210 special-class children in the Oakland Public Schools.

366
Terry, Paul W. "The Reading Problem in Arithmetic," Journal of Educational Psychology, XII (October, 1921), 365-77.

Presents the results of laboratory studies with adult subjects to determine the methods used in reading problems in arithmetic.

367
Terry, Paul W. "How Numerals are Read: An Experimental Study of the Reading of Isolated Numerals and Numerals in Arithmetic Problems," Supplementary Educational Monographs, No. 18. Chicago: Department of Education, University of Chicago, 1922.

Presents the results of an elaborate study of the reading of numerals by adults and discusses practical applications of the findings.

422
Wilson, Estaline. "Improving the Ability to Read Arithmetic Problems," Elementary School Journal, XXII (January, 1922), 380-86.

Reports the methods and the results of training sixth-grade pupils to read arithmetic problems.

Author Index

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Research on Reading in the Content Fields:
Science

4031
Aldridge, Billy G., and Anderson, Kenneth E. "Study of the Relationship of Fundamental Skills Measured by the National Merit Scholarship Qualifying Test to Natural Sciences Reading Ability," School Science and Mathematics, LX (June, 1960), 439-44.

Correlational analysis and multiple regression analysis were used to determine the relationship of four fundamental skills to natural sciences reading ability, a critical learning factor in science. Measures of each variable were taken from subtests of the National Merit Scholarship Qualifying Test given in Kansas. Using a sample of 300 cases, various statistics were computed. Correlations of the four subtests with the test on natural sciences reading were computed, using standard scores. From these correlations it was possible to determine the relative contributions, in terms of variance, of the four variables to the remaining variable, natural sciences reading. The results of the calculations revealed that ability in natural sciences reading was accompanied most intensely by abilities in word usage and social studies reading, and least intensely by abilities in mathematics usage and English usage. The educational implications of these findings are mentioned. Five tables are included.

6138
Bamman, Henry A. "Developing Reading Competencies Through Mathematics and Science," Reading as an Intellectual Activity, 8 (1963), 110-12.

Discusses the problem areas of reading in the content areas of math and science: vocabulary, comprehension, rate, diversified materials, and making relationships.

3810
Barnes, Cyrus W., Beck, Alfred D., Reiner, William B., Washton, Nathan S. "Criteria for Selecting Supplementary Reading Science Books for Intellectually Gifted High School Students," Science Education, XLII (April, 1958), 215-18.

A list of criteria for selecting supplementary reading books in the sciences is presented. The list was developed through replies to a questionnaire answered by 150 members of the National Association for Research in Science Teaching. The study emphasized criteria pertaining to science books (non-textbooks) for the intellectually gifted students. However, most of the criteria may be applied to all students in secondary schools. A copy of the questionnaire is given in Table I. Table II gives the six most important criteria in Category A (Effect on the Reader) and Category B (Qualities of the Book). Six implications and recommendations are discussed. Tables are given.

6269
Barrilleaux, L. E. "An Experiment on the Effects of Multiple Library Sources as Compared to the Use of a Basic Textbook in Junior High School Science," Journal of Experimental Education, 35 (Spring 1967), 27-35.

A 2-year longitudinal study of the effects of instruction on achievement and learning activities of eighth- and ninth-grade science classes was conducted. Variation for the experimental and control groups was based upon tested ability plus adaptation of basic reading and library-nontext materials. Criterion measures were obtained for pre-tests and post-tests of accomplishment for both grades. During ninth grade, library behavior was observed and recorded. Data were analyzed for each group for mean gains for critical thinking, scientific attitude, writing in science, and use of the library. Results indicated significant differences in favor of the library-nontext procedure. Increased independence and individual responsibility in locating learning materials was noted as a byproduct of the experiment. Findings imply that more effective use of printed materials should be made at this level of science instruction. References are included.

4367
Belden, Bernard R. "Utilization of Readability Formulas for Effective Instruction," Problems, Programs and Projects in College-Adult Reading (edited by Emery P. Bliesmer and Ralph C. Staiger), Eleventh Yearbook of the National Reading Conference, (1962), 139-47.

Readability appraisals of secondary and college-adult textbooks to discover the nature and difficulty of the reading demands on students in various curricula areas are described. The development of readability formulas and the findings of previous readability studies are discussed. Investigations at Oklahoma State University of the readability of state-adopted secondary science textbooks (biology, chemistry, physics) and of seven college-adult reading improvement books are summarized. Readability levels too high for the students using the various texts, particularly in high school biology and chemistry, are reported. Implications of the findings are discussed. A table listing the readability levels of the reading improvement books is included.

4368
Belden, Bernard R., and Lee, Wayne D. "Readability of Biology Textbooks and the Reading Ability of Biology Students," School Science and Mathematics, 61 (December, 1961), 689-93.

A study to determine the readability level of five general biology textbooks adopted for use in Oklahoma high schools and to determine the level of achievement in reading of students enrolled in high school biology classes is described. Textbooks evaluated by the Dale-Chall

Formula for Predicting Readability were New Dynamic Biology, Rand McNally and Co., 1959; Elements of Biology, Allyn and Bacon, 1959; Biology, D. C. Heath and Co., 1960; Modern Biology, Henry Holt and Co., 1951; and Exploring Biology, Harcourt Brace and Co., 1959. Students evaluated were 357 tenth graders in 14 sections of biology in six Oklahoma high schools. Reading levels were determined by the Nelson-Denny Reading Test, Form A Revised Edition. A comparison of the readability levels of the texts with the reading levels of the students was made. Only one of the five texts was found to have a readability level suitable for at least 50% of the students who use it. Higher readability levels are reported for the other four books. It is recommended that the selection of high school textbooks be governed by both the readability level of the text and the reading level of the students. References and tables are included.

4182
Belden, Bernard R., and Lee, Wayne D. "Textbook Readability and Reading Ability of Science Students," Science Teacher, 29 (April, 1962), 20-21.

A study to determine the readability level of selected science textbooks and to determine the reading level of the students expected to use these textbooks was conducted. Subjects were 135 students enrolled in nine sections of eleventh-grade physics in the public schools in Oklahoma. The Nelson-Denny Reading Test, Form A, Revised Edition was used to measure actual reading skills of the subjects. Readability of the materials used was based upon the Dale-Chall Readability Score for each textbook. Interpretation of the readability analysis was based upon the Mallinson criterion. Data are shown in tabular form. Results are discussed. References are included.

6273
Bennett, L. M. and Clodfelter, Cherie. "A Study of the Integration of an Earth Science Unit within the Reading Program of a Second Grade by Utilizing the Word Analysis Approach," School Science and Mathematics, 66 (1966), 729-36.

The formulation and evaluation of a new subject matter unit is reported. Nine earth science concepts were selected for study by 174 second graders in six classrooms. The traditional method and experimental methods I and II are defined for the control and experimental groups. A word analysis technique of instruction was developed by the chief researcher and used with the new resource unit of study. A chart including the technical vocabulary was given to each participating teacher, and pre-tests and post-tests on vocabulary and comprehension were administered to the three groups. Interaction between methods, past achievement, and improved learning were significant at the .005 level of significance. The word-analysis approach proved to be applicable and as good or better than the traditional method for second grade pupils. References are included.

2992
Bergen, Catharine, "The Prevalence of Mathematics in Science from 1900 to 1950," School Science and Mathematics, LI (June, 1951), 443-46.

Articles from the issues of the Physical Review and the Journal of the American Chemical Society of 1900 and decade years thereafter up to 1950 were analyzed to investigate the claim that chemistry and biology had become increasingly mathematical. It was concluded that although there did not seem to be any steady trend of increase in the use of mathematics in any one science, there were periods in which each science was lifted to a new mathematical level. This occurred in physics and in related areas of physical chemistry with respect to the use of the higher mathematical methods of quantum mechanics in the late 1920's. It occurred in chemistry with respect to mathematics in general during the decade between 1910 and 1920. It had beginnings in biology at about 1940. The significance of these changes was attributed to the attitude of respect toward mathematical science which the instructor passed on to his students and to the insight into the role which mathematical equations played in facilitating scientific discoveries. Tables are included.

5373
Blue, Larry Lamar. "A Study of the Influence of Certain Factors in Science Materials on the Reading Comprehension of Seventh Grade Pupils," Ed.D., Indiana University, 1964. Chairman: Leo Fay, Vol. XXV, No. 10, 5625. (Order No. 65-2363, Microfilm $3.00; Xerography $10.60, 232 pages.)

The influence of readability factors, style of writing, author's definitions, and students' general reading comprehension on their comprehension of science materials was studied. In addition to the eight science selections of 900 words each based on Kepler's Three Laws of Planetary Motion prepared by the author, other tests administered to the 240 randomly selected junior high school students included a four-item questionnaire rating scale, the reading section of the California Achievement Test, the California Survey Test of Science for junior high school pupils, and the Junior High California Short Form Test of Mental Maturity. The author utilized a 2 x 2 x 2 analysis of variance to test the null hypothesis, a linear hypothesis designed to refine the analysis involving intelligence, and the Pearson Product-Moment correlation to determine the relationship between measures of general reading, science information, and science reading comprehension. In his findings and conclusions, the author states that: (1) There was no significant difference in science reading comprehension between seventh-grade students who read selections containing variations in readability difficulty of at least three years, style of writing, and the use of author's definitions of certain technical science words. (2) Science reading comprehension of selection variations for seventh-grade students of high and low intelligence was significantly different. (3) The exploratory data results suggest that a more positive relationship exists between measures of general and science reading comprehension than between measures of science information and science reading comprehension. (4) Seventh-grade pupils are aware of the reading difficulty factors, but these factors have little influence on pupils' comprehension of more difficult graded science material. (5) The data suggests also that seventh-grade pupils are consistently more interested in expository style of writing.

3176
Brown, Clyde M. "Science Interests of Junior College Girls as Determined by Their Readings in Current Science," Science Education, XXXVII (March, 1953), 105-108.

The purpose of this study was to determine the areas of science interests of junior college girls, the sources from which they read, and what the nature of a science course built upon the girls' interests should be. The 10,215 reading reports made by 217 Stephens College female subjects from the basic science course were examined. The reports were analyzed to determine the source of each report and to find into which of the 20 interest categories each reading report should be classified. Interests were largely in the biological sciences, primarily those concerned with homocentric biology. Interests were low in technical science and in many areas which are commonly assumed necessary for general education. Short, concise articles from current news type magazines were the greatest source of reading. Interests were not related to course grades, but students with higher grades read from a greater variety of sources. A course built upon the categories which showed high interest may be inadequate to meet the needs of a general education science course.

4582
Carterette, Edward C., and Jones, Margaret Hubbard. "Redundancy in Children's Text," Science, 140 (June 21, 1963), 1309-11.

The results of a study of redundancy in children's texts are presented. Reading texts at levels 1, 2, 3, and 5 were compared with each other and with texts intended for adults. Letter redundancy was measured by using a slight modification of Newman and Waugh's method. The sequential constraints of pairs of letters were computed. Information in single letters was about the same for all texts. Redundancy decreased with increasing grade in a regular way, while mean word length increased. A third reader had about the same redundancy as simple adult text. The constraints in a first reader were considerable, whereas those in a fifth reader approached those in average adult text. Tables and references are given.

3609
Crooks, Kenneth B. M., and Smith, Charles H. "The Reading Problem in College Science Instruction," Science Education, XLI (February, 1957), 54-7.

A study of the reading ease of twenty popular textbooks used in college science courses was made in an effort to determine whether some of the failures in science courses might have been caused by the texts in use. The Flesch Reading Ease Scale and Flesch Human Interest Scale were applied to selected textbooks in biology, botany, chemistry, natural science, physical sciences, general education biology, and physics. Two books were rated fairly difficult. Eighteen were rated difficult. All twenty books were classified as dull on the interest scale. Implications of the effects of these difficult, dull textbooks on beginning college students are discussed. Suggestions for college science teachers and writers of college science textbooks are made. A bibliography of the books examined and two tables are included.

4216
Denslow, Orriene D. "Vocabulary and Sentence Study of Eight First Grade Science Books," Elementary English, 38 (November, 1961), 487-90.

On the premise that the vocabulary of science textbooks extends beyond that of most basal readers, a study attempted to discover if specific words were used consistently in eight selected first-grade science books, and if the texts differed widely in reading difficulty. Using these eight textbooks, dating from 1957 to 1961, a first-grade science vocabulary list was compiled. Eight items were set forth as criteria for the selection of 451 different words. Sixty-one words were considered basic because they were common to all eight books studied. The Dolch List and the Gates List were used to determine the level of difficulty. The Spache Readability Formula was used to indicate the average reading ability needed for adequate comprehension for each textbook. Tables show the vocabulary included, extent of usage, difficulty of the vocabulary, and range of difficulty in readability. References are included in footnotes.

6143
Fay, Leo. "Reading Study Skills: Math and Science," Reading and Inquiry, 10 (1965), 92-94.

Concludes that elementary teachers must guide children in applying reading study skills in their content fields, especially math and science.

6367
Hollenbeck, G. P. "Predicting High School Biology Achievement with the Differential Aptitude Tests and the Davis Reading Test," Educational and Psychological Measurement, 27 (1967), 439-42.

Scores in reading achievement and general ability were correlated with end-of-the-year biology achievement for three groups of tenth graders using different biology curricula. A comprehensive final examination in first-year biology designed for use with all three curricula was used. Data were studied for each curriculum group because the Differential Aptitude Tests (DAT) described differing average abilities of the students in the three groups. The DAT scales and the combined Verbal Reasoning and Numerical Ability scales were the best predictors. The Verbal Reasoning test alone was second best. High correlation between the Davis Reading Test and Verbal Reasoning and Numerical Ability indicated little gain in prediction as a result of a combination of them. Results indicated substantial validities for both the DAT and the Davis Reading Test in predicting first-year high school biology achievement. References are included.

5505
Howards, Melvin. "Measuring Children's Understanding of Selected Multiple-Meaning Words as it Relates to Scientific Word Lists," PhD., New York University, 1963. Vol. XXVI, No. 2, 905-906. (Order No. 63-6665, Microfilm $3.00; Xerography $5.40, 107 pages.)

Children's understanding of various meanings of selected high frequency, monosyllabic, multiple meaning words which appear in scientific word lists was measured. The study investigated whether there was a relationship between the children's scores on the Multiple Meaning Word Test (MMWT) and the following: intelligence, silent reading achievement, and reading vocabulary; and whether change in the parts of speech of these high-frequency words affected children's understanding. The boys' and girls' scores on the MMWT were also compared. A test was constructed of words which appeared in scientific word lists and were all considered easy or familiar words. The MMWT used 40 different monosyllables in four different contexts each, and it offered four choices for each item. The population was 526 pupils in grades four, five, and six. The major conclusions follow: a developmental pattern was exhibited by the upper elementary students; the ease or difficulty of the words was not solely dependent on frequency with which the words appear in reading context, but was significantly affected by which meaning of the words the reader knows; the difficulty of certain words classified as easy or familiar might be extremely difficult for certain readers depending on the particular context; and the individual who knew several different meanings of words was almost certain to know many different words. Very high positive correlations were found between the MMWT and IQ and the reading sub-test scores. No difference was found between the MMWT and boy-girl differences or the speech sub-problem. Additional findings are reported.

5513
Jacobson, Milton Durwood. "Reading Difficulty of Physics and Chemistry Textbooks in Use in Minnesota," Ph.D., University of Minnesota, 1961. Advisers: Clarence H. Boeck, Raymond O. Collier, XXII, No. 11, 3950-51. (Order No. 62-1790, Microfilm $2.85; Xerography $9.90, 218 pages.)

This study attempted to determine the relative reading difficulty of chemistry and physics textbooks, ascertain whether difficulty was operative in textbook selection, and develop regression equations for predicting the reading difficulty of physics or chemistry passages. Materials were selected from sixteen high school physics and chemistry texts, three college chemistry texts, two college physics texts, and a high school physical science text. The physics and chemistry texts were separated into ten content units, and two-hundred word samples were randomly selected from each unit. These were assembled into booklets and assigned to schools according to an incomplete Lating square design in which books were assigned to treatments, units to columns, and students to rows. The relative difficulty of a passage from a chemistry or physics text was defined as the number of words underlined by chemistry or physics students. The population consisted of students enrolled in classes from a randomly selected group of public high schools. Twelve schools were used for the physics study and ten for the chemistry study. The test-retest procedure for the Underlining Test established a product moment reliability correlation coefficient of .85 for chemistry and .97 for physics. Correlation of the number of passages underlined and scores on a vocabulary test indicated the students with larger vocabularies underlined fewer words. Thus, the Underlining Test was considered to be valid. Analysis of variance revealed a significant difference in reading difficulty between the texts used, the units used, and the school, by unit and student, by school interaction at the five- and the one-percent levels of confidence. Multiple regression equations, two each for chemistry and physics, were determined. Variables used included the average underlining score, average of words per sentence, concentration of simplified mathematical terms, concentration of words not on the first 6,000 of the Thorndike 30,000 word list, concentration of words not on Powers' list of 1,828 common science words, and average number of syllables per word. One equation was developed for physics and chemistry when the book-unit effects were extricated and another developed for physics and chemistry when these factors were not considered. The author concluded that reading difficulty is an important variable for selecting physics and chemistry textbooks. The regression equations developed are applicable for determining the reading difficulty of physics and chemistry texts.

4902
Jacobson, Milton D. "Reading Difficulty of Physics and Chemistry Textbooks," Educational and Psychological Measurement, 25 (Summer 1965), 449-57.

Findings from a study to determine the relative reading difficulty of physics and chemistry textbooks in use in Minnesota public schools, and to compute regression equations which would be valid for predicting the reading difficulty of physics and chemistry textbooks are reported. Students enrolled in chemistry or physics classes in randomly selected Minnesota public high schools were used. Reading difficulty was determined by means of the Underlining Test. There were significant differences in the reading difficulty among units from the chemistry and physics books.

Covariance and regression analyses were made to obtain equations for predicting reading difficulty of physics and chemistry passages by means of independent variables determined from the passages. Data for the analysis consisted of six measurements. The design chosen gave a two-way variance breakdown according to the level of reading difficulty of each unit and of each book to obtain the sums of squares and of products of the dependent and independent variables. Equations are given. Detailed explanations of procedures used, tables of all analyses, and references are given.

4655
Johnson, Kenneth G. "Dimensions of Judgment of Science News Stories," Journalism Quarterly, 40 (Summer 1963), 315-22.

The purpose of the study was to determine whether or not the various groups along a communication chain use essentially the same frames of reference or dimensions of judgment in judging science news stories. The procedure consisted of having a number of scientists, science writers, editors, readers, and non-readers of science news stories to rate several science news stories on a series of twenty-five semantic differential scales. The following differential scales were used: valuable-worthless, colorless-colorful, heavy-light, accurate-inaccurate, unexciting-exciting, clear-confusing, far-near, scientific-unscientific, harmful-helpful, new-old, weak-strong, adequate-inadequate, boring-interesting, rash-cautious, easy-difficult, realistic-unrealistic, low brow-high brow, significant-insignificant, passive-active, simple-complex, irresponsible-responsible, specific-vague, unsensational-sensational, threatening-reassuring, and important-unimportant. Each subject was given a booklet which consisted of a personal data sheet, instructions, a set of news stories, and a set of semantic differential forms. Five factors were isolated for each of the five groups. The results showed that the science writers were significantly closer to the scientists than were the editors, readers, or the non-readers. Editors and readers in turn were significantly closer to the scientists than to the non-reader. Other results are described. A discussion and conclusions follow the results. Results are reported in tabular form.

4092
Kearl, Bryant, and Powers, Richard D. "Estimating Understanding of Scientific Terms," Journalism Quarterly, XXXVIII (Spring 1961), 221-23.

The abilities of three groups of soil specialists to predict audience understanding of scientific or technical terminology were investigated in an attempt to explore the problem of technical vocabulary and concepts in modern journalism. The three groups were composed of (1) research workers, (2) extension workers, and (3) agriculture journalists respectively. Each group was asked to evaluate the difficulty of a 25-question multiple choice test of soils which had been administered to 102 Wisconsin farmers in personal interviews. Results of each group's evaluation were then compared with the farmers' scores. High correlations (above .71) are reported for all groups. It is concluded that there is an awareness among soil scientists of the problems involved in popularization of that science.

5530
Koester, Paul William. "Reading Science Materials for Two Specific Purposes at the Sixth Grade Level," Ed.D., University of Illinois, 1961. XXI, No. 12, 3717. (L. C. Card No. Mic 61-1631, Microfilm $2.90; Xerography $10.15, 223 pages.)

Fifty sixth-grade students were equated on the basis of intelligence test scores, divided into two groups and administered reading, science, and ability to read for problem-solving in science tests. Tests measured purposeful reading of science materials and checklists recording the students' self-perceived reading behavior, and perception of an ideal reader's behavior, constructed by the author, were also used. One group read to understand step by step directions while the other read to find the best explanation for an event. Passages were followed by two multiple choice items. Correlations, percentages, and "t" tests were used to check differences in reading time, relation between the tests and the standard reading scores and the check list responses. Purposes in reading were found not to affect rate, fast readers were not necessarily the best comprehenders, and high nonverbal intelligence scores tended to have high comprehension scores but intelligence did not predict rate. Those with high science scores on the standardized measures tended to achieve best on the constructed purposeful reading science test, but not when rate was measured. Readers who excel on one test of comprehension tend to excel on others. Readers who score high on comprehension may not score high on rate. Readers who read rapidly for one purpose may not read rapidly for other purposes. Purpose does seem to have some effect on rate strategy. Sixth-graders tend to manifest rigidity in reading irrespective of purpose. Confusion as to what constitutes an effective purposeful reading pattern was also evidenced with superior readers being less sure of the pattern than inferior readers.

6152
Larrick, Nancy. "Nature, Science, and Children's Reading," Changing Concepts of Reading Instruction, 6 (1961), 191-93.

Explains the four marks of excellence of children's science books and recent examples.

5548
Lepper, Robert Earl. "A Cross Cultural Investigation of the Relationships Between the Development of Selected Science-Related Concepts and Social Status and Reading Readiness of Negro and White First Graders," Ph.D., The Florida State University, 1965. Vol. XXVI, No. 8, 4501-02. (Order No. 65-15, 475, Microfilm $3.00; Xerography $5.40, 108 pages.)

The extent to which family social-status as measured by the McGuire-White Index of Value Orientation is related to the development of selected science related conservation tasks developed by Jean Piaget was explored. A correlational analysis was made between success on the Piagetian tasks and scores on the Metropolitan Reading Readiness Test. The tasks used in this study were the conservation of continuous substance, conservation of discontinuous substance, conservation of number, conservation of length, and conservation of area. The subjects were all first graders drawn from an all-Negro elementary school and an all-white elementary school. Thirty Negro and 30 white subjects were matched and stratified into three groups on the McGuire-White Index for the social-status comparisons. The correlations between success on the Piagetian tasks and scores on the Metropolitan Reading Readiness Test were positive, statistically significant, and numerically low. It was concluded that the practice of grouping children exclusively on the basis of reading readiness scores for their science classes should be seriously questioned. Additional findings are included.

3965
Lockwood, J. Bryce. "Research on Problems in Reading Science," School Science and Mathematics, LIX (October, 1959), 551-56.

A summary of findings of research studies dealing with problems of reading science and implications of these investigations is presented. Studies are classified under the following headings: development of scientific vocabularies, determination of the level of reading difficulty of textbooks for science, ability of teachers to estimate the reading difficulty of science textbooks, and selection of science textbooks.

4286
Major, Alexander G., and Collette, Alfred T. "The Readability of College General Biology Textbooks," Science Education, 45 (April, 1961), 216-24.

An investigation of whether the currently used and preferred college general biology textbooks were written within the estimated reading comprehension level of college freshmen students is reported. A questionnaire was sent to colleges throughout the nation to ascertain which biology texts were used and preferred. Out of 168 questionnaires sent, 136 were returned. The ten most frequently used and preferred texts were selected for readability analysis by the Flesch Scale. In determining the readability score, one hundred word samples were taken from every tenth page. For each textbook, six scores were obtained. Means and standard deviations were used to analyze the data. On the basis of Flesch's interpretation of readability data, the most frequently-used and preferred general biology textbooks were written beyond the reading comprehension level of college students. The reduced readability of general biology texts was due, primarily, to a high syllable index. Recommendations, tables, references, and an alphabetical list of the texts analyzed are included.

3034
Mallinson, George Greisen, Sturm, Harold E., and Mallinson, Lois M. "The Reading Difficulty of Textbooks in Junior High Science," School Review, LVIII (December, 1950), 536-40.

Twelve series of junior high science textbooks (10 for grades 7, 8, and 9 and two for grades 7 and 8) were analyzed by the Flesch formula to determine readability levels. The Flesch reading levels were then compared with the purported reading level of each book. The significance of differences between the high three and low three textbooks in grades 7 and 8 and the high two and low two in grade 9 were computed by Fisher's t analysis. It was found (1) that the grade 7 textbooks were more likely to be more difficult for the students for whom they were designed than were the eighth and ninth grade textbooks, (2) that the eighth grade texts were relatively easy, (3) that the textbooks for grade 9 had the greatest range of difficulty, (4) that there was no noticeable progression of difficulty within any of the books, and (5) that the differences between levels of difficulty between the easiest and most difficult textbooks for each grade level were significant. Tables and references are included.

3133
Mallinson, George G., Sturm, Harold E., and Mallinson, Lois M. "The Reading Difficulty of Textbooks for General Science," School Review, LX (February, 1952), 94-8.

Previous studies indicated that the difficulty levels of many science textbooks were too advanced for the level intended. The investigation was extended to include 16 other junior high general science textbooks from which 100-word samples were selected by a modified Flesch sampling technique and analyzed by use of the Flesch readability formula. Significance of differences was tested by Fisher's t formula. Results showed that the difficulty levels of the books ranged from the sixth to the 10th grade levels, a range wider than that of the junior high science books analyzed earlier. The difficulty levels of passages within each of the 16 books varied greatly. The books contained easy as well as difficult passages, and earlier passages were not necessarily easier than later ones. In general, the books analyzed in this study were more suitable at the ninth-grade level than at the seventh- or eighth-grade levels. Hence, they need to be adjusted to conform with the trend of extending general science to grades seven and eight. Tables are included.

3233
Mallinson, George Greisen, Sturm, Harold E., and Mallinson, Lois Marion. "The Reading Difficulty of Textbooks for High-School Physics," Science Education, XXXVI (February, 1952), 19-23.

It was the purpose of this study to evaluate textbooks for high school physics with respect to their levels of reading difficulty. The Flesch formula was used to evaluate the readability of all sixteen of the high school physics books found. One sample passage for each 100 pages or fraction thereof was selected for analysis. It was found that there is great variability among and within high school physics books. The 11 textbooks whose grade level of reading difficulty is "ninth grade completed" or below, are not likely to be difficult for the average eleventh or twelfth grade physics student. Neither are they likely to cause great difficulty for the below-average student. The three textbooks whose grade level of reading difficulty is between "ninth grade completed" and "tenth grade completed" are not likely to be difficult for the better student, are not too difficult for the average student, but are likely to be difficult for the less able student. The two textbooks whose grade level is "high school completed" or higher are likely to be difficult even for the superior student. The most difficult textbook seems to be above the level of comprehension of even some college students. The level of reading difficulty seems to be a valid criterion for evaluating a textbook in physics. References are included.

3234
Mallinson, George Greisen, Sturm, Harold E., and Mallinson, Lois Marion. "Reading Difficulty of Textbooks for High-School Chemistry," Chemical Education, XXIX (December, 1952), 629-31.

The reading difficulty of the textbooks for high school chemistry was investigated. Twenty-two textbooks were sampled and the significances of differences between various levels of difficulty were computed. The levels of reading difficulty of the passages within separate textbooks varied from a grade level difficulty of grade 7 to college completed, while the grade levels of difficulty of textbooks varied from grade 8 to high school completed. Textbooks of chemistry vary less in range of reading difficulty than those for physics designed for students of the same grades. Textbooks of chemistry, as a group, are not likely to be as difficult for the students for whom they were designed as are textbooks in other fields of science. The earlier passages in the chemistry books do not seem to be consistently lower in level of reading difficulty than later passages. Thus, no provision seems to be apparent for growth of reading ability during the year. Tables are included.

2939
Mallinson, George Greisen, Sturm, Harold E., and Patton, Robert E. "The Reading Difficulty of Textbooks in Elementary Science," Elementary School Journal, L (April, 1950), 460-63.

The Flesch formula was used to determine the reading difficulty of five elementary science series--grades four, five and six. Five 100-word samples were taken from each book randomly. The Flesch formula is based on the assumption that the reading difficulty of material depends on the number of words in the sentences, the relative number of personal references (I, you, etc.) in the material, and the number of affixes and suffixes (syllabification) to the words. The following are conclusions. (1) To be of value, books designed for fourth-grade science should have grade levels below the fourth grade. (2) Grade five textbooks are rather difficult for the pupils for whom they are written. (3) Textbooks in science for grade six are only slightly difficult. (4) The reading difficulty of textbooks should increase gradually as the grade level of the pupils increases. In nine of the 15 books used in this study, the passages taken from the earlier portions were more difficult than samples taken from later portions. Tables depicting Reading-Difficulty Scores and Grade Levels Equivalent to Reading Difficulty Scores are included.

5563
Maney, Ethel Swain. "Literal and Critical Reading in Science," Ed.D., Temple University, 1952. XXIII, No. 5, 1627. (Order No. 62-3376, Microfilm $3.10; Xerography $10.80, 238 pages.)

3875
Maney, Ethel Swain. "Literal and Critical Reading in Science," Journal of Experimental Education, XXVII (September, 1958), 57-64.

The relationships between "general" reading comprehension, scientific reading comprehension, and verbal intelligence, as revealed by fifth grade children, were investigated. Subjects were 513 fifth graders in the last month of school from eighteen classes, 9 urban and 9 suburban, in the Philadelphia area. A special test to assess scientific reading comprehension, the Intermediate Reading Test: Science, was constructed. Reliability of the test was determined. In addition, the Gates Reading Survey, Level of Comprehension, and the Pintner General Ability Test, Verbal series, were administered. Terminology is defined and procedures listed. Intercorrelations, chi-square, point bi-serial correlations, and several measures of item analysis were used to analyze the data. There was a substantial correlation between literal and critical reading comprehension in science. There was a very high relationship between verbal intelligence and "general" reading ability. There was a high relationship between verbal intelligence and literal science reading, and between "general" reading comprehension and literal science comprehension. Conclusions, implications, and a bibliography are included.

4450
Marshall, J. Stanley. "Comprehension and Alleged Readability of High School Physics Textbooks," Science Education, 46 (October, 1962), 335-46.

A study was conducted to determine how well the Flesch Reading Ease formula would predict comprehension of a passage in electricity in a high school physics textbook. The procedures used to choose the textbook, the particular passage to be analyzed, and the readability formula and the methods of constructing and establishing reliability of the comprehension test are explained. Two hundred physics students in six high schools in Central New York were given the Cooperative Reading Comprehension Test (Form T) and the Cooperative Physics Test (Form Z). Subjects were then classified, on the basis of these scores into four groups: 1A--good in reading and physics; 1B--good in reading, poor in physics; 2A--poor in reading, good in physics; 2B--poor in reading and physics. Members of each of these groups were placed in two experimental groups. Half read the original textbook passage (Group I); the other half (Group II) read a rewritten passage covering the same subject but with increased readability. All subjects were given the same comprehension test. Results were analyzed according to the two main groups and the sub-groups within them. No relationship between readability and comprehension is indicated by the results. It is concluded that use of the Flesch formula for high school physics textbooks is unjustified. The findings and the resulting recommendations are discussed. Tables and references are included.

4291
Martin, Mavis, and Lee, Wayne. "Sample Frequency in Application of Dale-Chall Readability Formula," Educational Research Bulletin, 40 (September, 1961), 146-49.

The efficiency of a readability index derived from two interval samplings was surveyed. The Dale-Chall Formula was selected as the tool for measurement, using the five high school biology textbooks adopted for use in Oklahoma. The samples in this study began with the first word in the first sentence of each selected page. Using only passages of continuous material, samples were taken at 10-page intervals, and the next readability testing was done with samples at 50-page intervals. Means and standard deviation for each distribution were determined. A t test of significance was applied to indexes on each textbook used, and for the five textbooks combined. The means, standard deviations, standard error of means, and the t scores are shown in tabular form. Questions for further study are posed. No references other than those found in footnotes are listed.

5231
Newport, John F. "The Readability of Science Textbooks for Elementary Schools," Elementary School Journal, 66 (October, 1965), 40-43.

The readability levels of 9 series of elementary school science textbooks are reported. The Spache formula was to evaluate materials for grades one to three, and the Yoakam formula was to evaluate materials for grades four to six. Various numbers of 100-word units were used at different grade levels as a check to determine the effect the number of units would have on the results. It was concluded that the number of 100-word units included in the study was sufficient. The Cleland table was used to arrive at the intermediate readability level of textbooks because it facilitates the rapid conversion and interpolation of data. Tables show the readability levels of the 54 textbooks and indicate the approximate changes in four series from one edition to the next. Caution must be used in interpreting the levels because of possible inadequacies in the readability formulas used in the study. The high readability level of the intermediate grade textbooks was due in part to the fact that the Yoakam formula is based on Thorndike's 1932 word list. The readability levels of the primary grade textbooks were well suited to the average reader for whom the textbooks were intended. The readability levels of the intermediate grade textbooks varied widely from series to series. References are given.

5593
Newport, John Frank. "An Evaluation of Selected Series of Elementary School Science Textbooks," Ed.D., University of Miami, 1965. Supervisor: Mark Murfin, Vol. XXVI, No. 2, 800-801. (Order No. 65-8015, Microfilm $3.00; Xerography $5.80, 119 pages.)

An evaluation of selected series of elementary school science textbooks was made with reference to teachers' objectives in the teaching of science. The following series of textbooks were evaluated: Allyn and Bacon; American Book Company; Ginn; Harper and Row; Heath; Lyons and Carnahan; Macmillan; Singer; and Winston. An evaluation instrument was derived from a synthesis of pertinent judgments expressed by authorities in the field of education, research findings concerning science books, elementary science textbook authors, elementary science specialists, and elementary school teachers. The rating of each series on the evaluation criteria was determined by pooling the judgments of five evaluators. The following evaluation criteria were used: mechanical make-up and attractiveness...; philosophy or point of view of the author(s); content; organization; developmental methods; visual aids; formula readability level; teaching aids; and provisions for meeting objectives. It was concluded that the Heath, Macmillan, or Ginn series would best meet the needs of teachers who find that reading is a problem in their classrooms. Additional findings and conclusions are included.

5237
Ottley, L. "Readability of Science Textbooks for Grades Four, Five, and Six," School Science and Mathematics," 65 (April, 1965), 363-66.

The readability of science textbooks published between 1959 and 1962 for grades four, five, and six was measured with the revised Lorge formula. Sentence length, number of prepositional phrases, and number of hard words from every tenth page were the bases of analysis. Grade levels for the individual pages were computed; their average determined the grade level of the book. Most of the books evaluated showed no reading growth. Science textbooks were far too difficult for fourth grade students. The fifth grade books were slightly difficult, while sixth grade books were best suited for their intended grade level. Tables and references are included.

4716
Patterson, Charles W. "Pilot Project in Reading and Study Habits," The Reading Teacher, 17 (April 1964), 531-35.

An experiment to determine whether the reading and study skills of college freshmen could be improved, particularly in mathematics and science, through a special two-credit reading course is described. Subjects were two groups (37 students in the experimental group, 30 in the control group) of second-semester freshmen, enrolled in the secondary curriculum at West Chester State College, Pennsylvania. Students in both groups were pre- and post-tested with the Iowa Silent Reading Test for High School and College (Forms C and D), the Essential High School Content Battery Achievement Test (A and B), and Nelson High School English Test (A and B). Control group students were enrolled in a two-credit reading course taught by the English department; experimental students received specific training in reading techniques, study skills and habits, vocabulary, and speeded reading in a specially designed laboratory course meeting five days per week. Significant gains were made by the experimental group in all areas tested; little or no improvement was shown by the control group. A discussion of the results of the experiment and student reactions to it is given. Recommendations for improvements in the program are made.

4732
Robinson, Edward J. "Analyzing the Impact of Science Reporting," Journalism Quarterly, 40 (Summer 1963), 306-14.

The impact of science on people's thinking and behavior is reported. It was hypothesized that there would be an external impact as opposed to an internalization of scientific information which would be reflected in public opinion. An intensive survey was conducted in 1960. Subjects were 100 people from the major occupational categories, age groups, religious backgrounds, and educational levels. A non-probability sample was employed. A projective drawing, seven news headlines divided into physical, social, and medical categories, and questions on three products of research were included in the interview. People did not understand science because of lack of knowledge or because of a supposed lack of intelligence. There was a more positive feeling toward the physical sciences than toward the medical and social sciences. As a group, the subjects were unable to verbalize reasons as to how science affected their lives. Discussion, conclusions, and two references are included.

5626
Roossinck, Esther Pauline. "Purposeful Reading of Science Materials by Scientists and Children," Ed.D., University of Illinois, 1960. XXI, No. 11, 3382. (L. C. Card No. Mic 61-193, Microfilm $2.75; Xerography $8.60, 190 pages.)

The purpose of this investigation was to compare the methods used by scientists in reading science material to understand the main idea and to relate facts and ideas in sequence, with reading comprehension and rate scores and practices considered ideal by sixth-grade children. Twenty-four scientists read for the main idea and twenty-four read to relate facts and ideas in sequence. Comprehension questions answered by forty sixth-graders were also answered by the scientists. Overt reading behaviors were noted, reading and question answering time recorded, and a structured interview used to enable the scientist to explain how he thought the ideal reader would read. It was concluded that science material is read differently when read for different purposes, some reading practices of scientists are different from the reading practices of children, and some reading practices of scientists are different from practices which children believe ideal readers would use when reading science material.

4495
Severson, Eileen E. "The Teaching of Reading-Study Skills in Biology," American Biology Teacher, 25 (March, 1963), 203-04.

An experiment is described in which standard procedures are used to improve reading capabilities of biology students. Four 10th grade biology classes were divided into two experimental groups and two control groups for the experiment. The students were matched on the basis of age, sex, and reading ability. The control classes received regular instruction. The experimental classes were instructed in skills for vocabulary development and were given extensive instruction in word analysis techniques. A brief description of the vocabulary instruction is given. At the end of the first semester a vocabulary examination was given. The experimental classes showed an average increased achievement of 17 percent over the control classes. The findings are discussed.

4140
Shores, J. Harlan. "Reading of Science for Two Separate Purposes as Perceived by Sixth Grade Students and Able Adult Readers," Elementary English, XXXVII (November, 1960), 461-68.

Four questions were posed concerning reading science material: What do sixth graders think that they do when they read for main ideas? For ideas in sequence? Is it the same way their ideal readers would attack these tasks? Are either of these the same as the way good adult readers say that they do it? Two groups of both sixth graders and adults were studied. One group read science passages of 200 to 400 words to note the single main idea. The other group read the same passages for a sequence of ideas. The forty-six sixth graders were semi-rural students from the southeastern coast of the United States; the adult sample consisted of fifty-one advanced undergraduate and graduate education majors. After each of 20 sessions, responding to one passage in each session, the sixth graders were administered a test and two questionnaires concerning how they thought they had read the passage and how the ideal readers would have read it. The adults responded to five of the same passages at one sitting and to the test and questionnaire as well. Both groups were checked on comprehension and speed. Means, standard deviations, and percentages were used to analyze the data. Adults scored better on all passage tests. The questionnaires showed that sixth graders were not flexible in rate when reading for different purposes. Sixth graders had unclear ideas of how the best reader would read for the two different purposes. Suggestions for educators are included.

4141
Shores, J. Harlan. "Reading Science Materials for Two Distinct Purposes," Elementary English, XXXVII (December, 1960), 546-53.

A testing program was initiated to determine how sixth grade children read science materials when their purpose is directed toward: (1) main ideas, or (2) toward keeping a series of ideas in sequence. Children in a semi-rural locality closely equivalent in chronological age, mental age, science achievement, and general reading abilities were selected and administered standardized tests of reading achievement, intelligence and achievement in science. The pupils were given the author's unpublished tests: (1) Reading for Problem Solving in Science, which measured ability to do directed reading for the solution of problems in science; and (2) Directed Reading of Science Materials Tests, a series of twenty successive tests to be given in two parts--one for the group reading for the main idea and one for the group reading for a series of ideas in their proper sequence. Analysis of most of the data was made with product moment correlations. It was found that: (1) reading for main ideas (Purpose A) is more like what is measured by tests of general reading ability than is reading for a series of ideas in sequence (Purpose B), (2) that the purpose for reading influences the speed of reading,

(3) that speed and comprehension scores on a general reading test are not necessarily good predictors for other material read for other purposes, and (4) that the kinds of things measured by Purpose A are stronger factors in science achievement and in nonverbal intelligence than those measured by Purpose B. Other results and conclusions are given. References and tables are included.

4142
Shores, J. Harlan. "Are Fast Readers the Best Readers?--A Second Report," Elementary English, XXXVIII (April, 1961), 236-45.

The relationship between reading speed and comprehension was studied. Data were collected from 46 sixth grade pupils and 51 able adult readers taken from several advanced undergraduate and graduate university-level courses dealing with the teaching of reading. A battery of tests designed to measure reading rate and comprehension was administered to the sixth graders. Several tests of reading ability in different requirement situations were given to the adults. Analysis of the data was made with product moment correlations between the various rate and comprehension scores. The correlations for both the sixth grade and the adult populations are shown in tabular form. It was found that the fast readers are the good readers on reading tasks of general reading ability as presented in standardized tests. No relationship was found between speed of reading and comprehension of more difficult, scientific material. Other results are discussed and conclusions are offered. References are given.

3264
Shores, J. Harlan, and Saupe, J. L. "Reading for Problem-Solving in Science," Journal of Educational Psychology, XLIV (March, 1953), 149-58.

The relationship between the Test of Reading for Problem-solving in Science and other measures was studied. The Test of Reading for Problem-solving in Science for grades 4, 5, and 6 consists of two passages of approximately 800 words each. Following each passage are 24 multiple choice items. Reliability of the test was assessed by the Kuder-Richardson formula. Correlations were made between the Science Test, New California Short-form Test of Mental Maturity, Progressive Achievement Tests, and sociometric measures. Correlations between the Science Test and the sociometric measures were so low that they were not reported. Eight hundred middle class students from central Illinois served as subjects. Intercorrelations among the Science Test, mental age, reading age, and arithmetic age were significantly positive. The highest correlation was between science reading and reading age. The lowest correlation was between science reading and chronological age. Reading in grades 4, 5, and 6 to solve problems in science has a common factor with measured mental ability and general achievement. References are included.

6157
Sochor, E. Elona. "Developments in Reading Abilities Evaluation," New Frontiers in Reading, 5 (1960), 108-112.

Discusses the statistical treatment and the testing for reliability of three tests in content areas: The Intermediate Reading Test, Social Studies, the Intermediate Test, Science, and the Diagnostic Reading Inventory in Science.

6502
Stauffer, R. G. "A Vocabulary Study Comparing Reading, Arithmetic, Health and Science Texts," The Reading Teacher, 20 (1966), 141-47.

Reports a comparative word count made in seven basic reading series and in three series each of three different content areas for grades one, two, and three.

5003
Stevens, John D. Readability in 20 Technical Journals. Circular 10, Washington State Institute of Technology. Pullman: Technical Extension Service, Washington State University, 1964. Pp. 6.

The Gunning readability formula is used to determine the difficulty level of 60 articles appearing in 20 scientific and technical journals. The median score for the 20 journals was 14.21, the college sophomore level, which was considered appropriate for technical publications. Scientific writers tend to defend a high Gunning score by saying that it is due to the necessary use of polysyllabic words. Actually, about 85 percent of the articles reviewed scored higher on sentence length than on polysyllable count. This discussion of the problems of technical writing is concluded with the suggestion that a readability formula be used by scientific authors. References are given.

4335
Swinehart, James W., and McLeod, Jack M. "News About Science: Channels, Audiences, and Effects," Public Opinion Quarterly, 24 (Winter 1960), 583-89.

The effect on the American public of the launching of the first earth satellite by the Russians in October, 1957, is discussed. Six months after the launching of Sputnik I a probability sample of 1,547 adults was interviewed by the field staff of the Survey Research Center to obtain data on the extent and accuracy of satellite information, patterns of news intake, and general attitudes toward science and scientists. A separate earlier survey during the month following the launching of Sputnik I had also been made. It was found that virtually everyone had heard of the Russian satellite during the month following the launch and that this awareness was reinforced, though not extended, over the longer six month period. The events were not perceived in a scientific frame of reference. A large proportion of the public had previously had favorable opinions toward science and scientists and these opinions were not altered by the satellite launching. A small change toward an increased awareness of the scope and power of science on the part of the population with no previously well-developed image of science was noted. Over-all patterns of media were not affected by the scientific event. A greater interest in science was shown by men, and education, income, and number of media used were noted as being highly related to satellite information. References and tables are included.

3279
Tarleton, Raymond. "Accuracy and Comprehension in Science News Writing," Journalism Quarterly, XXX (Winter, 1953), 69-71.

In a study to determine whether inaccuracy in science writing increases when the ease of comprehension is increased, 40 articles concerning biochemistry, organic, and inorganic chemistry appearing in the New York Times, Minneapolis Sunday Tribune, Minneapolis Star, Time, Life, Newsweek, Reader's Digest, and Coronet between July 1 and September 30, 1950, were examined. All 40 stories were tested for reading ease by the Flesch readability formula and checked for ambiguities and inaccuracies. Those articles appearing in the newspapers were divided into two categories--staff written and wire service. Articles were ranked according to difficulty. Wire services presented the easiest material, followed by the weekly and monthly magazines. Four inaccurate stories were discovered, (three in the New York Times), but no relationship between difficulty and inaccuracy was found. Neither was there a relationship between length of article and accuracy. The New York Times was reported to have the most complete science coverage of the periodicals analyzed. The problem of accurate science writing is discussed in relation to the findings. A table is included.

5333
Weaver, E. K., and Black, E. "The Relationship of Science Fiction Reading to Reasoning Abilities," Science Education, 49 (1965), 293-96.

A study designed to discover to what extent frequent reading of science fiction increases science reasoning ability is reported. Forty-two high school students in Fulton County, Georgia, were selected on the basis of responses to a science fiction reading inventory. The subjects were divided into two groups--readers and non-readers of science fiction. Both groups were tested with the Sequential Tests of Educational Progress: Science (Form 2A) of the Cooperative Test Division, Educational Testing

Service. However, this test was felt to have many limitations for the purposes of this study. The frequent reading of science fiction does not appear to result in improvement or influence the structure of science reasoning abilities as measured by the STEP Science test. Other findings relative to intelligence and sex differences and science reasoning are given in the article. References are included.

5711
Williams, David Lee. "The Effect of Rewritten Science Textbook Materials on the Reading Ability of Sixth-Grade Pupils," Ed.D., University of Illinois, 1964. Vol. XXV, No. 11, 6442. (Order No. 65-3695, Microfilm $2.75; Xerography $9.25, 203 pages.)

The effect of rewritten science materials on sixth-grade pupils' reading comprehension and reading rate was investigated. The sample population consisted of 417 pupils who were randomly assigned to form control or experimental groups. In addition, three achievement levels were used. The analysis of variance was the statistical technique used. From an analysis of the findings, the author concluded that rewriting sixth-grade science textbook selections through simplification of style and vocabulary helped sixth-grade pupils to significantly increase their reading rate and reading comprehension.

Supplementary References, 1900-1950

July 1, 1947 to June 30, 1948

2751
Ledbetter, Frances Gresham. "Reading Reactions for Varied Types of Subject Matters. An Analytical Study of the Eye Movements of Eleventh-Grade Pupils," Journal of Educational Research, XLI (October, 1947), 102-15.

Presents an analysis of the eye-movement records of 60 eleventh grade pupils while reading five 300 word selections from the fields of English, mathematics, science, and social studies which had been equated on various bases.

July 1, 1945 to June 30, 1946

2611
Von Qualen, Vivian D., and Kambly, Paul E. "Children's Interests in Science as Indicated by Choices of Reading Materials," School Science and

Mathematics, XLV (December, 1945), 798-806.

Reviews previous studies to determine the various approaches made to the problems. Reports the results of a study in grades 4, 5, and 6 to determine the scientific interests of children as indicated by their choices of reading materials.

July 1, 1944 to June 30, 1945

2486
Curtis, Francis D. "The Mathematical Vocabulary Used in Secondary-School Textbooks of Science," Journal of Educational Research, XXXVII (October, 1944), 124-31.

Analyzes the vocabulary used in thirty-three textbooks of science to determine which of the difficult words found were mathematical terms.

July 1, 1943 to June 30, 1944

2442
Krause, La Vern W. "A Comparison of Two Methods of Study," Elementary School Journal, XLIV (September, 1943), 45-48.

Reports results of an experiment in eight science classes including 102 matched pairs of fifth- and sixth-grade pupils to determine the relative merits of reading (A) to answer questions and (B) to formulate a test covering the subject studied.

July 1, 1942 to June 30, 1943

2376
McMahon, Otis. "A Study of the Ability of Fifth-Grade Children to Read Various Types of Material," Peabody Journal of Education, XX (January, 1943), 228-33.

Describes a test including four different types of material--arithmetic, literature, social studies, science-- and analyzes the results obtained through giving it to 867 fifth-grade pupils.

2392
Schneck, John W., and Curtis, Francis D. "The Important Scientific Terms in High School Physics," School Review, L (December, 1942), 715-20.

Identifies the scientific terms of most importance in the judgment of 13 authors of textbooks and 46 professors of physics, and which merit inclusion in glossaries of textbooks of high-school physics.

2396
Shores, J. Harlan. "Skills Related to the Ability to Read History and Science," Journal of Educational Research, XXXVI (April, 1943), 584-93.

Summarizes the results of a study among ninth-grade pupils to determine the relationships between certain study and reading skills and reading comprehension of scientific and historical materials.

2407
Swenson, Esther J. "A Study of the Relationships Among Various Types of Reading Scores on General and Science Materials," Journal of Educational Research, XXXVI (October, 1942), 81-90.

Compares the scores of 217 eighth-grade pupils on the Traxler silent reading test and on a reading test based on science materials.

July 1, 1941 to June 30, 1942

2240
Kessler, Edward. "The Readability of Selected Contemporary Books for Leisure Reading in High School Biology," Science Education, XXV (October, 1941), 260-64.

Reports the results of a study of 35 books to determine their difficulty on the basis of "average sentence-length in words" and "number of different hard words."

July 1, 1940 to June 30, 1941

2101
Bond, Elden A. Tenth-Grade Abilities and Achievement. Teachers College Contributions to Education, No. 813. New York: Teachers College, Columbia University, 1940. 68 pp.

Reports interrelationships between tenth-grade abilities, such as intelligence, reading comprehension, reading speed, study skills, reading vocabulary, and scholastic achievements in English, history, geometry, and biology.

2196
Williams, Alice Marietta. Children's Choices in Science Books. Child Development Monographs, No. 27. New York: Teachers College, Columbia University, 1939. 164 pp.

Analyzes the characteristics of books--format, illustrations, subject matter, method of treatment, reading difficulty, and style--that cause pupils to read the book, like it, and derive benefit from it.

July 1, 1939 to June 30, 1940

2032
Masters, Harry G. "A Difficulty Analysis of Basic Readers and the Correlation of Their Content with School Subjects," Pittsburgh Schools, XIV (January-February, 1940), 106-34.

Presents an analysis of the content of fourteen basic readers showing the extent of and correlation with such subjects as geography, history, and science.

July 1, 1938 to June 30, 1939

1860
Curtis, Francis D. Investigations of Vocabulary in Textbooks of Science for Secondary Schools. Boston: Ginn and Company, 1938. 127 pp.

Reports and interprets 100 investigations dealing with vocabulary problems arising in connection with secondary school textbooks on science.

July 1, 1937 to June 30, 1938

1818
Stevenson, Elmo N. "An Investigation of the Vocabulary Problem in College Biology," Journal of Educational Psychology, XXVIII (December, 1937), 663-72.

Presents conclusions based on the study of a master word list derived from weekly word lists handed in by students.

July 1, 1935 to June 30, 1936

1612
Rice, R. S. "Extensive Reading Versus Intensive Textbook Study as a Means of Acquiring a Knowledge of Scientific Facts and Principles,"

Journal of Experimental Education, IV (June, 1936), 376-402.

Summarizes data secured from 1,708 pupils in three Pennsylvania high schools enrolled in general science, biology, physics, and chemistry.

July 1, 1934 to June 30, 1935

1443
Campsen, Herman M., Jr., and Kronick, Jacob E. "The Relation of Failure in Chemistry to Reading," High Points in the Work of the High Schools of the City of New York, XVI (December, 1934), 12-16.

Presents data based on records from 48 high school boys showing the relation between test scores in chemistry and achievement in reading.

July 1, 1932 to June 30, 1933

1250
Blank, K. J. "Improving Reading in Biology," School Science and Mathematics, XXXII (November, 1932), 889-92.

Presents the results of informal tests of rate and comprehension before and after definite training and guidance in reading were provided.

July 1, 1931 to June 30, 1932

1191
McCallister, James M. "Determining the Types of Reading in Studying Content Subjects," School Review, XL (February, 1932), 115-23.

Summarizes the results of observations and analyzes the materials and techniques of teaching junior-high-school history, mathematics, and general science to determine the types of reading required.

July 1, 1930 to June 30, 1931

1065
Kitzmiller, A. B. "Certain Vocabulary Problems in High School Chemistry," Science Education, XV (November, 1930), 33-43.

Reports the results of a study in which the words of Pressey's technical vocabulary in chemistry were classified and the familiarity of high-school pupils and college students with these words was determined.

1073
McCallister, James M. "Reading Difficulties in Studying Content Subjects," Elementary School Journal, XXXI (November, 1930), 191-201.

Classifies according to underlying causes the reading difficulties encountered by pupils in grades 7 and 8 in studying American history, mathematics, and general science.

July 1, 1927 to June 30, 1928

737
Melvin, Linton, and Hill, Harry A. "A Comparison Between the Biological Content of Certain Periodical Literature and the Kansas High School Course of Study," University of Kansas Bulletin of Education, I (December, 1927), 21-23.

Criticizes the Kansas high-school course in biology in the light of an analysis of the biological content in seven non-specialized American magazines.

1219
Skinner, H. Clay. "The Relationship Between Reading Ability and Class Marks in College Subjects," Journal of Educational Research, XVII (February, 1928), 137-38.

Summarizes data from 165 college students to determine the relationship between class marks and scores on reading tests in psychology, economics, and poetry.

July 1, 1926 to June 30, 1927

588
Columba, Sister M. A Study of Interests and Their Relations to Other Factors of Achievement in the Elementary School Subjects. Catholic University of America Educational Research Bulletins, Vol. I, No. 7. Washington: Catholic Education Press, 1926. 36 pp.

Reports the findings of a study to determine children's preferences for different school subjects, the reasons for these preferences, their permanency, and their relation to achievement.

614
Harlan, Charles L. "The Technical Vocabulary of Psychology," Journal of Educational Psychology, XVII (November, 1926), 554-57.

Describes the results of vocabulary tests involving psychological terms given to five hundred normal-school students before and after the study of psychology.

631
Kendall, Joseph L. "Progress Above Expectation in the Fundamental Subjects at a School for Mexican Children," Educational Research Bulletin (Los Angeles City Schools), VI (December, 1926), 10-13, 15.

Describes the steps taken to improve the achievement of Mexican children in the fundamental subjects and the progress above expectation made during seven months.

654
Powers, S. R. "A Vocabulary of Scientific Terms for High School Students," Teachers College Record, XXVIII (November, 1926), 220-45.

Presents the results of a study of the uncommon important scientific terms found in eleven science textbooks and in fifty scientific articles.

July 1, 1925 to June 30, 1926

542
Livingston, Ralph. "The Interrelations of the Vocabularies in Public-School Subjects," Educational Research Bulletin (Ohio State University), V (May, 1926), 208-13.

Reports the results of a comparison of the Pressey technical vocabularies in public-school subjects and the Thorndike word list. Shows overlappings in Pressey's various lists.

July 1, 1924 to June 30, 1925

443
Beauchamp, Wilbur L. "An Investigation of Pupil Progress in Elementary Physical Science," Studies in Secondary Education, II, Supplementary Educational Monographs, No. 26. Department of Education, University of Chicago, 1925. pp. 14-32.

Reports the results of a study to determine the factors influencing the rate of progress in an elementary physical-science class.

451
Curtis, Francis Day. Some Values Derived from Extensive Reading of General Science. Teachers College Contributions to Education, No. 163. New York: Teachers College, Columbia University, 1924. 142 pp.

Describes a series of experiments to determine the effect of extensive reading of general science on range of information, scientific attitude, and reading interests of pupils.

486
Powers, S. R. "The Vocabularies of High School Science Textbooks," Teachers College Record, XXVI (January, 1925), 368-82.

Compares the vocabularies of nine science textbooks with the 10,000 words of the Thorndike word list. Discusses the pedagogical significance of extensive vocabularies in textbooks.

July 1, 1900 to June 30, 1924

19
Beauchamp, Wilbur L. "A Preliminary Experimental Study of Technique in the Mastery of Subject-Matter in Elementary Physical Science," Studies in Secondary Education, I, Supplementary Educational Monographs, No. 24. Department of Education, University of Chicago, 1923. pp. 47-87.

Presents results of a series of classroom experiments to determine merits of different study procedures.

20
Beauchamp, Wilbur L. "Supervised Study in Elementary Physical Science," School Review, XXXII (March, 1924), 175-81.

Reports types of errors in reading and makes suggestions concerning their diagnosis and correction.

300
Pollock, C. A. "Children's Interests as a Basis of What to Teach in General Science," Educational Research Bulletin, III (January 9, 1924), 3-6.

Presents a list of science topics in which pupils expressed interest. Compares the preferences of boys and girls.

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Research on Reading in the Content Fields: Social Studies

6136
Aaron, I. E. "Developing Reading Competencies Through Social Studies and Literature," _Reading as an Intellectual Activity_, 8 (1963), 107-110.

Discusses reading in literature and social studies as a question of mastery of basal reading skills.

4357
Arnsdorf, Val E. "The Influence of Indefinite Terms of Time and Space on Comprehension of Social Studies Materials," _Challenge and Experiment in Reading_, 7 (1962), 159-161.

This investigation concerns itself with the effect of indefinite time and space terms upon children's understanding of social studies materials. Two sets of materials were chosen for the study: one consisted of two selections from basal textbooks and the other set consisted of an adjusted or rewritten form with indefinite expressions replaced with a more specific vocabulary. Open-end questions were used to check comprehension and were presented to 310 pupils in 12 classrooms in the intermediate grades. Responses to the same questions were taped for the remaining 92 pupils. A total of 412 pupils from 15 classrooms in the intermediate grades were tested. Reading levels were derived from the Gates Reading Survey. Data analysis included tests of mean differences between form, sex, and grade with reading comprehension and vocabulary scores controlled. Results and suggestions are included.

4358
Arnsdorf, Val E. "Readability of Basal Social Studies Materials," _The Reading Teacher_, 16 (January, 1963), 243-46.

Four basal social studies series for the elementary school are analyzed to determine levels of readability within and between books of a series. The Spache Readability Formula for Primary Grade Materials and the Dale-Chall Formula for Predicting Readability for intermediate grades were used. Each formula is based on two counts: the percentage of unfamiliar words and the average sentence length. Following a description of analysis technique, these conclusions are presented: (1) the readability of the social studies materials generally progresses according to the publishers' recommended sequences; (2) differences between the reading levels of primary and intermediate grade texts are considerable; and (3) the problem of continuity is not confined to comparisons of readability levels of the volumes of a series. Within each book the reader was confronted with printed materials at various levels of difficulty. The need for a higher degree of continuity between and within the levels of social studies materials was pointed out. References are given.

3172
Barrett, Dorothy M. "Correlation of Survey Section of Diagnostic Reading Tests and of Test C2: Reading Comprehension with College History Grades," *Journal of Educational Research*, XLVI (February, 1953), 465-69.

An investigation was undertaken to discover what particular reading tests, either singly or in combination, would be the best predictor of college history grades. Five scores from the Survey Section of the Diagnostic Reading Tests (Triggs), three scores from Test C2, and three scores from the 1947 edition of the American Council on Education Psychological Examination (ACEPE), were obtained from 200 freshmen at Hunter College. All scores on Test C2, Reading Comprehension, correlated more highly with a grade index in history than any of the scores from the Survey Section of the Triggs Test. A combination of speed and vocabulary scores on Test C2 yielded a higher multiple correlation with history than did the three parts of the Triggs Test. Scores from the ACEPE did not add anything significant to the correlation between history index and the combined speed and vocabulary scores. A multiple correlation based on speed and vocabulary scores of Test C2 was the most practical means for indicating probabilities of certain grades in history.

5372
Berry, Mary Tom. "A Study of the Vocabulary Load of *Geography of Many Lands*, An Alabama State-Adopted Text for the Fourth Grade," Ph.D., University of Alabama, 1961. Vol. XXII, No. 5, 1517-1518. (Order No. 61-4233, Microfilm $3.65; Xerox $12.85, 284 pages.)

The vocabulary of *Geography of Many Lands* was examined by sampling from the nine chapters, making a comparison with Dolch's First Thousand Words for Children's Reading, Dolch's Basic Sight Vocabulary, Dale's 3,000 Familiar Words, Clarence E. Stone's Revision of the Dale list of 769 Easy Words, Luella Cole's Handbook of Technical Vocabulary and applying the Dolch Graded Reading Difficulty Formula, the Dale-Chall Formula for Predicting Readability, and the Spache Formula for Predicting Readability. The findings revealed that the vocabulary load of this representative geography is relatively heavy for the average fourth-grade reader. Seventy-five percent of the different words appear on Dale's List of 3,000 Familiar Words. Nearly one-half appear in Dolch's First Thousand Words. Dolch's Sight Vocabulary represents seven percent of the different words but sixty percent of the words in the text. One of every twenty words is a technical geography term and one-fourth of the total running words are found on Stone's Revision of Dale's 769 Easy Words. Readability formulas place the text at "easy" fifth (Dolch), "middle" fourth (Dale-Chall), and "middle" third (Spache).

3177
Brownell, John Arnold. "The Influence of Training in Reading in the Social Studies on the Ability to Think Critically," California Journal of Educational Research, IV (January, 1953), 28-31.

Twenty-four matched pairs from two ninth-grade core curriculum classes were taught by the investigator. Those in the experimental group received additional training in reading, averaging approximately two hours per week out of a total of ten class hours per week, for 28 weeks. The mean gain in total score on the Watson-Glaser Critical Thinking Appraisal of the experimental group was significantly greater than the mean gain of the control group. The mean gain in total score on the Watson-Glaser test of those subjects in the experimental group who made better than average improvement in reading skills, as measured by the Progressive Achievement Test--Reading, was significantly greater than the mean gain of the matched control subjects. Statistical significance was based on the t-test. Complete findings, conclusions, and recommendations are included.

6140
Caudle, Jean I. "The Specific Reading Skills Necessary for Social Studies in the Elementary School," Improvement of Reading Through Classroom Practice, 9 (1964), 33-34.

Discusses nine reading skills which must be adapted to the specialized nature of social studies.

3724
Fridian, Sister M., and Rosanna, Sister M. "A Developmental Reading Experiment in a European History Class," Journal of Developmental Reading, I (Winter 1958), 3-7.

Developmental reading instruction was coordinated with a survey course in modern European history at Saint Francis College, Fort Wayne, Indiana. Eighteen students, mostly elementary teachers, enrolled in the history course during the 1957 summer session, were given training in increasing speed and comprehension of historical materials as a part of their regular classroom work. Twenty-four selections, 950-2250 words long, were chosen from the text, A Survey of European Civilization by Ferguson and Brunn, for timed reading exercises. A ten-question multiple-choice test designed to check recall of details, identification of central theme, and inferential reading was constructed for each selection. At the beginning of each class period, the students were given instruction in methods of improving speed and comprehension. A timed selection was read and comprehension was checked. The same selections were later used for training in critical thinking. Records of reading rate and comprehension scores were kept. Increases in rate by every student ranging from 23 to 563 words per minute are reported. The average gain was 291. An average comprehension gain of 11 percent was made. An over-all grade index improvement was noted for the class when grades were compared with those of a similar class taught in the past by the same professor. Suggestions for developing strong college reading programs are made. Tables are included.

6346
Goolsby, T. M., Jr. "Differentiating Between Measures of Different Outcomes in the Social Studies," Journal of Educational Measurement, 3 (1966), 219-22.

The nature of interrelationships among three experimental tests measuring various social studies outcomes and four reading skills of 555 eighth-grade students in 10 Iowa school systems was studied. The measures for the study included the following seven subtests of the Iowa Test of Basic Skills: Reading Comprehension, Map Reading, Reading Graphs and Tables, Knowledge and Use of Reference Materials, Judgment and Critical Thinking, Knowledge of Specific Facts, and Understanding of Terms. The analysis indicated a relatively high degree of overlap among the various measures. The interrelationships ranged from .74 to .99. There was no evidence of systematic between-school effects. The evidence suggests that as the social studies are presently taught, at least in the schools involved in this study, there is little statistical justification for differentiating among these particular outcomes. Tables are included.

6145
Herber, Harold L. "Reading Study Skills: Social Studies," Reading and Inquiry, 10 (1965), 94-96.

Discusses how teachers can help students transfer reading skills to social studies materials by providing motivation and purpose, guidance in using skills, and opportunity to react to new ideas.

6362
Herman, W. L., Jr. "The Use of Language Arts in Social Studies Lessons," American Educational Research Journal, 4 (1967), 117-24.

The proportion of elementary school social studies lesson time spent in listening, speaking, reading, and writing was investigated. The activities of 14 randomly selected fifth-grade classrooms near Washington, D.C., were analyzed. One observer visited each classroom intermittently during a month of social studies lessons. OSCAR was used to code activities. An inter-judge reliability was made at the beginning, middle, and end of the observation time. Children spent 75 percent of the time in listening activities. As the topic of study progressed, the verbal role of the teacher decreased. Over 40 percent of the time, the teachers and pupils were communicating verbally. Reading was assigned 13 percent of the time. The classes with higher intelligence scores were assigned significantly more reading assignments. Pupils in the below average group listened to the teachers twice as much as the above average group. Analysis of variance and chi square were used to analyze the differences among times visited and differences in kinds of activities used among the groups. Results of this analysis, a discussion, and references are included.

4086
Hislop, George R. "A Study of Division Two Social Studies Reading Skills," Alberta Journal of Educational Research, VII (March, 1961), 28-38.

The effects of a program of intensive training along problem-solving lines in the use of social studies reading skills were investigated in a study at the University of Alberta with 60 division two students (grades four, five, and six). The transfer of social studies reading skills to related areas was studied also. Experimental subjects were paired with controls on the basis of scores made on the Sequential Tests of Educational Progress test of reading ability. There were fifteen high achievers and fifteen low achievers, five for each grade, for both the experimental and control groups. A test-retest design was used. From February until June the experimental classrooms received intensive training in problem solving. To investigate growth in the ability to use social studies reading skills, a specially designed combination of written and verbal tests were administered. The t-test and the sign test for differences in paired samples were used to treat the February and June scores. Improvement in the use of social studies reading skill on social studies material, especially by upper-level pupils, was observed. Intensive training in the use of social studies reading skills appeared to assist pupils in related areas. Other results and their implications are discussed. Tables and references are provided.

6149
Huus, Helen. "Antidote for Apathy--Acquiring Reading Skills for Social Studies," Challenge and Experiment in Reading, 7 (1962), 81-88.

Hypothesizes that the answer to apathy in social studies is pupil skills, materials, and teacher attitude and preparation.

6148
Huus, Helen. "Using Children's Books to Extend the Social Studies," *Changing Concepts of Reading Instruction*, 6 (1961), 186-191.

Presents five ways in which books help to strengthen understandings in social studies.

5551
Lidberg, Richard George. "Reading Comprehension Difficulties in Fourth, Fifth, and Sixth Grade Social Studies Textbooks," Ph.D., The University of Iowa, 1965. Chairman: Lloyd L. Smith, Vol. XXVI, No. 10, 5893. (Order No. 66-3456, Microfilm $14.30; Xerography $50.85, 1126 pages.)

Responses to reading selections from three commonly used social studies textbooks, at fourth, fifth, and sixth grade levels were collected and analyzed. Eighteen reading selections were randomly chosen from nine textbooks on three grade levels and the reading difficulty was evaluated through use of the Dale-Chall Formula. Three forms of multiple choice comprehension tests and cloze test were devised for the material. The comprehension test scores of 317 children were correlated with the grade equivalent scores of the reading, work-study skills, and composite results of the Iowa Tests of Basic Skills. Pupils were tested using a cloze test and additional students were interviewed about the reading material to determine concepts and word understandings. Indications were noted in the intercorrelations of the comprehension and cloze tests that some of the same skills were measured at the fourth grade level, fewer at the fifth grade level, and skills of a different nature at the sixth grade level. There was also an indication that the Dale-Chall Formula predictions and the cloze tests had a relationship more in common at the sixth grade level than at the fourth grade level, but a higher correlation between cloze results and grade equivalent scores on the ITBS existed at the fourth grade level. The lowest correlation between cloze results and ITBS grade equivalent scores was found at the sixth grade level. Additional findings and conclusions are included.

4931
Lyda, W. J., and Robinson, Verna A. "Quantitative Concepts in Selected Social Studies Textbooks for Second Grade," *Elementary School Journal*, 65 (December, 1964), 159-62.

Using Jarolimek and Foster's classification of categories of quantitative concepts ("Quantitative Concepts in Fifth-Grade Social Studies Textbooks," *Elementary School Journal*, May, 1959) including definite and indefinite references to quantities of objects, space and time, three widely used second-grade level social studies textbooks were analyzed to identify types of quantitative concepts and frequency of appearance in the textbooks. A multiple-choice test of one hundred items was then constructed to test second-grade pupils' understanding of the concepts. Forty-five second-grade pupils, who had been divided into three groups on the basis of the Otis Quick-Scoring Mental Ability Tests and the Reading Section of the Stanford Achievement Test, were administered the test. It was found that the order of frequency of quantitative references ranged from indefinite references to objects, space and time, and then to definite references to objects, space and time, in that order. On the multiple-choice test it was shown that pupils in the above average group in intelligence and reading understood three-fourths of the concepts; those in the average group understood a little less than one-half of the concepts; and those in the below average group understood less than one-fourth of the concepts. Suggestions to teachers to help their pupils better understand quantitative concepts are listed. Tables and references are included.

5577
Metzner, Seymour. "An Analysis of Multilevel Intermediate Grade Enrichment Literature Relating to American History," Ed. D., University of Miami, 1965. Supervisor: Mark Murfin, Vol. XXVI, No. 2, 799-800. (Order No. 65-8014, Microfilm $4.55; Xerography $16.00, 354 pages.)

Multilevel intermediate grade enrichment literature relating to American history was analyzed. Data were compiled from current juvenile literature catalogs and periodicals. The books were subdivided into "Fiction," "Biography," and "Other Non-Fiction" categories, and were arranged in three reading levels based on catalog recommendations. Information regarding author, title, price, publisher, and classification was coded and placed on data cards for use in data processing devices. The following conclusions were supported: many trade books in juvenile historical literature are suitable for supplementary history reading; specific areas of American history lack a sufficient number of books of particular literary types and different reading levels; books at the lowest reading level are most needed; selected people, events, and movements are unavailable; and publishers' standards for judging reading levels of juvenile literature vary. Detailed findings and additional conclusions are given.

4974
Robinson, H. Alan. "Reading Skills Employed in Solving Social Studies Problems," The Reading Teacher, 18 (January, 1965), 263-69.

Twelve fourth graders attending the University of Chicago laboratory schools participated in a study to determine the reading skills actually used by pupils of this age when they attempt to solve problems in social studies. All subjects scored from above average to superior in reading ability on a standardized test. The average age was 9.6 and the average intelligence quotient was 127. Each subject met with the examiner individually to work on a social studies problem which consisted of two parts: the location of specific information and some interpretation of ideas. He was asked to solve the problem by reading any of the materials supplied, to write a rough report of his findings, to "think out loud," and to tell the examiner why he was doing certain things. Lists of comprehension and reference skills were compiled in two tables. Results showed that many necessary skills were inadequately developed. Suggestions for improving these skills are given to the classroom teacher. References are mentioned.

4740
Rushdoony, Haig A. "Achievement in Map-Reading: An Experimental Study," Elementary School Journal, 64 (November, 1963), 70-75.

A study indicating that third grade children can learn many of the map-reading skills typically taught in the fourth and fifth grades is reported. Arithmetic skills are also improved by the type of instruction used in this study. Reading skills were neither impaired nor improved. A representative sample of 129 third graders from a West Coast city was assigned randomly to two groups. The experimental group received advanced instruction in fourth and fifth grade map-reading skills. The control group followed the traditional third grade social studies program. Measurements for initial and final tests were the Iowa Tests of Basic Skills (Map Reading); the reading and arithmetic tests of the Stanford Achievement Test, Elementary Battery; and the California Test of Mental Maturity. References are given.

5666
Sochor, E. Elona. "Literal and Critical Reading in Social Studies," Ed.D., Temple University, 1952. XXXIII, No. 5, 1634. (Order No. 62-3379, Microfilm $6.10; Xerox $21.60, 480 pages.)

Abstract not available.

3896
Sochor, E. Elona. "Literal and Critical Reading in Social Studies," Journal of Experimental Education, XXVII (September, 1958), 49-56.

The relationships between verbal intelligence and three types of reading ability: "general" reading, literal comprehension, and critical interpretation, were investigated in relation to social studies. Complete data were obtained on a representative sample of 513 fifth-grade children.

A reading skills test developed for the social studies area is described along with its validation and reliability prediction. The Gates Reading Survey, Form I, Level of Comprehension, was administered to appraise "general" reading ability, and the Pintner General Ability Test, Form A, to obtain verbal intelligence quotients. Product-moment correlation was used to estimate the degree of relationship between intelligence, "general" reading ability, and literal comprehension and critical interpretation in social studies. Partial correlation was used to estimate the degree of relationship between the three types of reading ability when intelligence was partialled out. Chi-square was used to determine the relationship between literal reading and each critical reading skill. Point-biserial correlation was utilized to estimate the degree of relationship between literal reading and each critical reading skill. Significant relationships were found between verbal intelligence and "general" reading ability, and between "general" reading ability and literal comprehension. Substantial relationships were found between the following factors: verbal intelligence and literal comprehension and critical interpretation; "general" reading ability and critical interpretation; and literal comprehension and critical interpretation. It was concluded that reading comprehension in social studies is apparently a composite of many skills and abilities functioning at various levels of mental activity. Further research is suggested. A 34-item bibliography is provided.

6157
Sochor, E. Elona. "Developments in Reading Abilities Evaluation," New Frontiers in Reading, 5 (1960), 108-112.

Discusses the statistical treatment and the testing for reliability of three tests in content areas: The Intermediate Reading Test, Social Studies, the Intermediate Test, Science, and the Diagnostic Reading Inventory in Science.

3285
Wagner, Louise Durkee. "Measuring the Map-Reading Ability of Sixth-Grade Children," Elementary School Journal, LIII (February, 1953), 338-44.

A study which used a specially constructed test to measure the map-reading ability of sixth-grade children in Syracuse, New York, is reported. The percentage of correct answers of 100 pupils on test items dealing with specific map-reading skills is presented in table form. Such skills as using a key to read scale of miles, giving geographic directions on maps of various projections, giving longitude and latitude, and using meridians and parallels to tell directions received comparatively low percents of correct answers. Skills taught in lower elementary grades received higher percentages of correct answers. The various skills are discussed, and reasons for their being poorly understood are suggested.

4533

Witt, Mary. "A Study of the Effectiveness of Certain Techniques of Reading Instruction in Developing the Ability of Junior High-School Students to Conceptualize Social Studies Content," Journal of Educational Research, 56 (December, 1962), 198-204.

A study was conducted at Florida University laboratory school to determine the amount of observable changes brought about in reading, in social studies in general, and in the development of 10 specific social studies concepts through classroom instruction and guidance. The 62 seventh-grade students of the University School were divided into two groups equated on the basis of the average of the students' scores on the California Language and Social Studies Tests, Intermediate Form CC. The following tests were administered during the first month of school: (1) The California Reading Test, Intermediate Form BB, (2) The California Language Test, Intermediate Form BB, (3) The California Short-Form Test of Mental Maturity, Junior High-School Level, 1957 S Form. For the purpose of this study, the following tests were administered in October: (1) The STEP Social Studies Test, Form 3A, (2) The Iowa Silent Reading Test, Form AM (Revised). Comparable tests were administered in February and once again in June. The study concluded: (1) that significant gains were made in both reading and in social studies during each semester, (2) that significantly greater gain was made during the second semester period in social studies, and (3) that teaching by the method of 10 selected concepts produced a statistically significant gain in concept scores for both groups of students. Statistical data are presented in tabular form.

3803

Wyatt, Nita M., and Ridgway, Robert W. "A Study of the Readability of Selected Social Studies Materials," University of Kansas Bulletin of Education, XII (May, 1958), 100-105.

The difficulty of materials used for instruction in fifth grade social studies in Kansas was investigated. The readability of the state-adopted social studies texts was determined through the use of the Dale-Chall readability formula, and it was found that only one of the texts was too difficult for the fifth-grade level. The reading abilities of fifth-grade pupils in three Kansas school systems were found to range over more than eight grade levels. Only 31 percent of the pupils were within one grade level of their grade placement, 55 percent scored more than one grade level higher, and 14 percent scored more than one grade level lower. A bibliography of supplementary materials for use with a typical fifth-grade unit of work was compiled. Conclusions, based on the study, are given. References, a table, and a figure are included. The bibliography of graded supplementary materials for use with a unit on the North Central States is included.

Supplementary References, 1900-1950

July 1, 1948 to June 30, 1949

2853
Rudolf, Kathleen Brady. "The Effect of Reading Instruction to Achievement in Eighth Grade Social Studies," *Contributions to Education No. 945*. New York: Bureau of Publications, Teachers College, Columbia University, 1949.

Presents the results of a controlled experiment to determine the effects of one term of reading instruction in a social studies class on social studies knowledge, reading ability, and study skills.

2883
Yoakam, Gerald A. "The Place of Textbooks in Children's Reading," *A Report of the Fourth Annual Conference on Reading, June 28 to July 9, 1948*. Pittsburgh, Pa.: University of Pittsburgh, 1949. pp. 65-75.

Traces the history of textbooks in American education and presents grade placements by the Yoakam formula of recent textbooks in history and geography, which reveal significant differences as compared with the publishers' placements of the books.

July 1, 1947 to June 30, 1948

2733
Guckenheimer, Sig N. "The Readability of Pamphlets on International Relationships," *Educational Research Bulletin*, XXVI (December 10, 1947), 231-38.

Presents the readability scores of samples of 36 pamphlets on international affairs derived through the use of the Dale-Chall formula for predicting readability.

2751
Ledbetter, Frances Gresham. "Reading Reactions for Varied Types of Subject Matters. An Analytical Study of the Eye Movements of Eleventh Grade Pupils," *Journal of Educational Research*, XLI (October, 1947), 102-15.

Presents an analysis of the eye-movement records of 60 eleventh-grade pupils while reading five 300-word selections from the fields of English, mathematics, science, and social studies which had been equated on various bases.

July 1, 1944 to June 30, 1945

2494
Grady, Marion. "Recommendations for Supplementary Reading Made by Textbooks in United States History," The School Review, LIII (April, 1945), 227-36.

Compares the amount of supplementary reading recommended in five textbooks for use in history at the senior high school level published between 1910 and 1920, and a similar number published between 1930 and 1940.

July 1, 1942 to June 30, 1943

2312
Arnold, Henry F. "The Comparative Effectiveness of Certain Study Techniques in the Field of History," Journal of Educational Psychology, XXXIII (September, 1942), 449-57.

Reports the results of an experimental study at the college level of the relative effectiveness of repetitive reading, underscoring and marginal notemaking, outlining, and precise writing.

2318
Bolton, Floyd B. "A Study of Vocabulary Growth in the Social Studies," Social Education, VII (January, 1943), 17-18.

Reports the scores made on the East Chicago social science vocabulary tests in grades 7 to 12 inclusive and the changes during a year in various social studies courses.

2319
Brown, D. D. "The Teaching of Current Events in Nebraska High Schools," School Review, L (September, 1942), 523-28.

Summarizes the results of a questionnaire study among 236 high schools in Nebraska to determine the extent, objectives, materials, and methods of teaching current events.

2376
McMahon, Otis. "A Study of the Ability of Fifth-Grade Children to Read Various Types of Material," Peabody Journal of Education, XX (January, 1943), 228-33.

Describes a test including four different types of material -- arithmetic, literature, social studies, science -- and analyzes the results obtained through giving it to 867 fifth-grade pupils.

2396
Shores, J. Harlan. "Skills Related to the Ability to Read History and Science," Journal of Educational Research, XXXVI (April, 1943), 584-93.

Summarizes the results of a study among ninth-grade pupils to determine the relationships between certain study and reading skills and reading comprehension of scientific and historical materials.

July 1, 1941 to June 30, 1942

2300
Whipple, Gertrude. "Elements in Geography Readiness," Elementary School Journal, XLII (December, 1941), 256-67.

Identifies by means of a questionnaire the significance attached by teachers to certain aspects of reading ability as elements in geographic readiness.

2301
Wiedefeld, M. Theresa. "An Experimental Study in Developing History Reading Readiness with Fourth-Grade Children," Johns Hopkins University Studies in Education No. 31. Baltimore, Md.: Johns Hopkins Press, 1942.

Compares the progress in knowledge of and ability to read history of two equated groups, one taught by the usual textbook method and the other by the wide use of oral instruction, pictures, playground projects, excursions, etc.

2308
Young, William E. "Recent Research on Reading in the Social Studies," Education, LXII (September, 1941), 18-26.

Summarizes a series of studies which support the assumption that improvement of instruction in the social studies involves improvement of reading ability.

July 1, 1940 to June 30, 1941

2101
Bond, Elden A. "Tenth-Grade Abilities and Achievements," Teachers College

Contributions to Education, No. 813. New York: Teachers College, Columbia University, 1940.

Reports interrelationships between tenth-grade abilities, such as intelligence, reading comprehension, reading speed, study skills, reading vocabulary, and scholastic achievements in English, history, geometry, and biology.

2136
Grim, Paul R. "Interpretation of Data and Reading Ability in the Social Studies," Educational Research Bulletin, XIX (September 25, 1940), 372-74.

Presents data and correlations which show that ability to interpret data and ability to read the social sciences are somewhat related but also differentiated functions at the junior high school level.

2169
Phipps, William Rodgers. "An Experimental Study in Developing History Reading Ability with Sixth-Grade Children Through Development of History Vocabulary," Johns Hopkins University Studies in Education, No. 28. Baltimore, Md.: Johns Hopkins University Press, 1940.

Presents the results of a controlled experiment with groups of sixth-grade pupils to improve the reading of history material by developing facility in the use of the language of history.

July 1, 1939 to June 30, 1940

2032
Masters, Harry G. "A Difficulty Analysis of Basic Readers and the Correlation of Their Content with School Subjects," Pittsburgh Schools, XIV (January-February, 1940), 106-34.

Presents an analysis of the content of fourteen basic readers showing the extent of and correlation with such subjects as geography, history, and science.

2033
Masters, Harry G. "A Difficulty Analysis of Supplementary Readers and Basic Geography and History Texts in the Comprehensive Reading Program--Grades Four to Six," Pittsburgh Schools, XIV (March-April, 1940), 139-66.

Reports the results of a study in grades 4 to 6 inclusive, to determine the relative difficulty of textbooks in geography, history, and science and of related selections in readers.

2055
Sayre, Harrison M. "Teaching Reading in the Current Events Class," *Journal of Educational Research*, XXXIII (April, 1940), 561-68.

Reports the results of an experiment to discover what progress in reading skills average high school students might make if introduced to modern reading techniques in connection with their study of current events.

2087
Wrightstone, J. Wayne. "Growth in Reading Maps and Graphs and Locating Items in Reference Books," *School Review*, XLVII (December, 1939), 759-66.

Summarizes data secured from pupils in grades 7 to 12 inclusive through the use of 1936 form of the Iowa every-pupil test in basic study skills. Shows progress curves for grade, mental age, and chronological age groups.

July 1, 1938 to June 30, 1939

1868
Dolch, E. W. "Fact Burden and Reading Difficulty," *Elementary English Review*, XVI (April, 1939), 135-38.

Presents findings of a tentative study regarding the "fact" burden of school textbooks, with comparisons of books from first- to sixth-grade levels, dealing with geography, history, science, and health.

1921
Meighen, Mary, and Barth, Ethel. "Geographic Material in Third-Grade Readers," *Elementary English Review*, XV (December, 1938), 299-301.

Compares geographical concepts and references contained in third-grade readers published in 1925-30 with those published in 1930-37.

1928
Phipps, William Rodgers. "An Experimental Study in Developing History Reading Ability with Sixth-Grade Pupils Through the Development of an Active History Vocabulary," *Journal of Experimental Education*, VII (September, 1938), 19-23.

Attempts to determine the relation of growth in ability to use the language of history in written expression and the ability to read history material in which the expressions and patterns of language are found, using as subjects 186 sixth-grade pupils.

July 1, 1937 to June 30, 1938

1780
Harvey, C. C., and Denton, Cecil F. "Use of Newspapers in Secondary Schools," School Review, XLVI (March, 1938), 196-201.

Presents findings of a study made in forty-four senior high schools to determine what use the schools are making of the newspaper in the classroom work and what effort is being made by the schools to train pupils to become intelligent users of newspapers.

1796
Malan, C. T. "What Should People Read in Democratic Governments," School and Society, XLVI (December 18, 1937), 806-8.

Presents data relative to the use of books, magazines, and newspapers as a means of developing intelligent citizenship.

July 1, 1935 to June 30, 1936

1565
Dewey, Joseph C. "A Case Study of Reading Difficulties in American History," Doctoral Theses in Education, III. University of Iowa Studies in Education, Vol. X, No. 1. Iowa City, Iowa: University of Iowa, 1935. 26-54.

Reports the results of a study to determine the nature and the limitations of comprehension in reading history at the eighth-grade level.

July 1, 1934 to June 30, 1935

1445
Chase, W. Linwood. "Determination of Grade Placement of History Material," Journal of Educational Research, XXVIII (April, 1935), 593-96.

Reports the results of applying to different passages in a history textbook the Vogel-Washburne formula for determining reading difficulty.

1491
Leavell, Ullin W., and Hollister, George E. "Social Studies Vocabulary Difficulties in the Upper Grades," Peabody Journal of Education, XII (May, 1935), 287-93.

Presents the results of a vocabulary test given to pupils in grades seven and eight and compares them with the findings of other investigators.

1492
Leggitt, Dorothy. "Measuring Progress in Working Skills in Ninth-Grade Civics," School Review, XLII (November, 1934), 676-87.

Presents the results of a controlled experiment to measure the progress of ninth-grade pupils in the use of certain working skills in the study of social science material when practice in the use of these skills was provided.

1510
Newburn, Harry K. "The Relative Effect of Two Methods of Vocabulary Drill on Achievement in American History," Doctoral Theses in Education, II, pp. 9-30. University of Iowa Studies in Education, Vol. IX, No. 3. Iowa City, Iowa: University of Iowa, 1934.

Summarizes the results of controlled experiments including more than nine hundred pupils to determine the effect on vocabulary development and on achievement in American history of devoting a portion of the history hour to more or less formal drill on word meanings.

1538
Weede, Robert O., and Gilbert, Luther C. "Vocabulary Growth in American History in the Secondary School," School Review, XLIII (June, 1935), 440-45.

Summarizes the results of tests given to first and second semester pupils to determine the amount of growth in meaning vocabulary.

July 1, 1933 to June 30, 1934

1372
French, Lloyd Charles. "The Effect on Achievement in Geography of Specific Training in Vocabulary. The Reading of Maps, Graphs, and Tables, and Organization," University of Pittsburgh Bulletin, XXIX (January, 1933), 83-92.

Summarizes the results of a controlled experiment involving 703 junior high school pupils.

July 1, 1932 to June 30, 1933

1261
Cramer, John Francis. "Relative Difficulty of Junior High School Social Studies Texts," Journal of Educational Research, XXVI (February, 1933), 425-28.

Compares the actual grade placement of eight texts in the social sciences with the grade for which they are adapted as determined through the use of the Vogel-Washburne technique.

1268
Dynes, John J. "Comparison of Two Methods of Studying History," Journal of Experimental Education, I (September, 1932), 42-45.

Reports the methods and results of a study to determine the relativeness of two methods of studying social science material at the junior high-school level.

1283
Gunderson, Agnes G. "Geographical Materials Contained in Readers for the First Three Grades," Elementary School Journal, XXXIII (April, 1933), 608-15.

Reports the results of an analysis of ten series of readers used in the first three grades to determine the amount of space devoted to geographical facts and concepts, also the amount of material relating to each of ten topics.

1310
Pressey, L. C., and Pressey, S. L. "The Determination of a Minimal Vocabulary in American History," Educational Method, XII (January, 1933), 205-11.

Reports the steps taken and the findings in efforts to identify the words of vital importance from the total mass of technical words used in the social sciences (mainly history).

1332
Weaver, Robert B. "Extensive and Intensive Methods in History," Historical Outlook, XXIII (October, 1932), 292-96.

Describes the guides used in extensive reading and intensive study activities in history and presents data showing the relative merits of the two methods of study.

July 1, 1931 to June 30, 1932

1130
Brown, Robert. "Vocabularies of History and Reading Textbooks," The Principal and Supervision, Tenth Yearbook of the Department of Elementary School Principals. Washington: Department of Elementary School Principals of the National Education Association, 1931. 408-11.

Presents the results of a comparative study of the vocabularies of 5 histories and 5 readers for sixth grade use with respect to the number of new words included, the length of words, and their rating on the Thorndike list.

1181
Kelty, Mary G. "A Suggested Basic Vocabulary in American History for the Middle Grades," Journal of Educational Research, XXIV (December, 1931), 335-49.

Presents a basic vocabulary in American history, and compares it with the nine published lists of words.

1191
McCallister, James M. "Determining the Types of Reading in Studying Content Subjects," School Review, XL (February, 1932), 115-23.

Summarizes the results of observations and analyzes the materials and techniques of teaching junior-high-school history, mathematics, and general science to determine the types of reading required.

1232
Waples, Douglas. "Reading Studies Contributory to Social Sciences," Library Quarterly, I (July, 1931), 291-300.

Discusses significant reading problems which should serve as a basis for cooperative research among students of librarianship and those interested in the social sciences.

July 1, 1930 to June 30, 1931

1066
Lacey, Joy Muchmore. "What Effect Has the Emphasis on Social Studies Had on the Content of Readers," Educational Method, X (June, 1931), 532-37.

Presents the results of an analysis of the content of ten sets of readers used in grades 1 to 3, inclusive, to determine the amount and types of social studies material included.

1073
McCallister, James M. "Reading Difficulties in Studying Content Subjects," Elementary School Journal, XXXI (November, 1930), 191-201.

Classifies according to underlying causes the reading difficulties encountered by pupils in grades 7 and 8 in studying American history, mathematics, and general science.

1119
Weaver, Robert B. "The Relative Value of Intensive Study and Extensive Reading in United States History," School Review, XXXIX (March, 1931), 217-26.

Compares the results secured by seventh-grade pupils when reading historical accounts extensively and when reading a limited amount of material intensively and preparing exercises focused upon it.

July 1, 1929 to June 30, 1930

905
Barr, A. S., and Gifford, C. W. "The Vocabulary of American History," Journal of Educational Research, XX (September, 1929), 103-21.

Presents the results of an analysis of the vocabulary used in eight textbooks in history for senior high schools.

941
Hathaway, Gladys M. "Vocabulary Difficulties in a Fourth Grade History Test," University of Pittsburgh School of Education Journal, V (June, 1930), 116-23.

Presents an analysis of the vocabulary in a fourth-grade textbook in history and summarizes the results of comprehension tests involving the words.

964
Newlun, Chester Otto. Teaching Children to Summarize in Fifth Grade History. Teachers College Contributions to Education, No. 404. New York: Teachers College, Columbia University, 1930. 76 pp.

Describes the methods and results of an experiment to determine whether ability to summarize the important facts in lessons increases achievement in history or in reading.

982
Simpson, Robert Gilkey. "The Effect of Specific Training on Ability to Read Historical Materials," Journal of Educational Research, XX (December, 1929), 343-51.

Presents the results of an experiment among 1,074 fifth-, sixth-, and seventh-grade pupils to determine the effect of specific training in reading historical materials.

984
Smock, Lenna E. "The Relative Difficulty to the Reading Content of the Intermediate Grade History Textbooks Commonly Used in the State of Indiana," Sixth Annual Conference on Elementary Supervision, Bulletin of the School of Education, Indiana University, Vol. VI, No. 1, pp.5-11, 1929.

Summarizes the results of a study to determine the vocabulary of fifteen textbooks in history used widely in the middle grades.

July 1, 1928 to June 30, 1929

856
Nudelman, Edward A. "Pupil Exercises Used in Elementary History Textbooks," Elementary School Journal, XXIX (January, 1929), 351-57.

Reports the number and percentage of various types of exercises in elementary history textbooks.

873
Shambaugh, C. G. "A Study of the Vocabulary of Ancient History Texts," School and Society, XXVIII (October 20, 1928), 494-96.

Summarizes the results of a study of the vocabularies of five textbooks in ancient history.

875
Simpson, Robert Gilkey. "The Effect of Training in Organization on Ability to Read Historical Materials," Abstracts of Dissertations for the Degree of Doctor of Philosophy, Volume IV, 1928, pp. 85-92. University of Pittsburgh Bulletin, Vol. 25, No. 1, Pittsburgh, Pa.: University of Pittsburgh, 1928.

Summarizes the results of an elaborate study of 1,074 pupils in grades 5 to 7 to determine the effect of training in organization on ability to read historical materials.

878
Stephenson, Orlando W. "The Special Vocabulary of Civics," Journal of Educational Research, XVIII (November, 1928), 297-304.

Reports the approximate frequency of words of special significance in civics in ten textbooks in that field.

July 1, 1927 to June 30, 1928

696
Boyer, Beatrice Violet. "A Study of the Recommendations for Collateral Reading Found in American History Textbooks for the Senior High School." Unpublished Master's Thesis, Department of Education, University of Chicago, 1927. 121 pp.

Presents the results of a detailed analysis of the collateral reading recommended in nineteen textbooks in American history for use in senior high schools.

715
Gatto, Frank M. "The Effect of Parallel Reading in History," University of Pittsburgh School of Education Journal, II (September-October, 1927), 3-8.

Presents the results of an experiment with two seventh-grade history classes to determine the effect on comprehension and retention of supplementing the material in the textbook.

724
Kyte, George C. "Experimentation in the Development of a Book to Meet Educational Needs," Educational Administration and Supervision, XIV (February, 1928), 86-100.

Describes more or less objective procedures in developing a textbook in the social studies for use in the fourth grade.

744
Moser, Karl Wonder. "A Vocabulary Study of Textbooks in American History for the Senior High School." Unpublished Master's Thesis, Department of Education, University of Chicago, 1927. 139 pp.

Presents the results of an analysis of the vocabularies of thirteen textbooks in American history for the senior high school and the results of tests to determine whether pupils know the words found.

1219
Skinner, H. Clay. "The Relationship Between Reading Ability and Class Marks in College Subjects," Journal of Educational Research, XVII (February, 1928), 137-38.

Summarizes data from 165 college students to determine the relationship between class marks and scores on reading tests in psychology, economics, and poetry.

July 1, 1926 to June 30, 1927

572
Ayer, Adelaide M. Some Difficulties in Elementary School History. Teachers College Contributions to Education, No. 212. New York: Teachers, College, Columbia University, 1926. 70 pp.

Presents the results of studies in the fifth and seventh grades to determine the extent to which pupils comprehend what they read in history and the extent to which failure is due to difficult words, terms, and expressions.

588
Columba, Sister M. A Study of Interests and Their Relations to Other Factors of Achievement in the Elementary School Subjects. Catholic University of America Educational Research Bulletins, Vol. I No. 7. Washington: Catholic Education Press, 1926. 36 pp.

Reports the findings of a study to determine children's preferences for different school subjects, the reasons for these preferences, their permanency, and their relation to achievement.

599
Garnett, Wilma Leslie. "Factual Versus Story-Factual Material," Elementary English Review, III (October, 1926), 268-71.

Presents the findings of a study in grades 3 to 6 to determine whether factual or story-factual material is more effective in teaching geography.

630
Keboch, F. D. "Variability of Word-Difficulty in Five American History Texts," Journal of Educational Research, XV (January, 1927), 22-26.

Reports the relative difficulty of the vocabularies of five seventh-grade textbooks in American history as determined by comparison with the Thorndike word list.

631
Kendall, Joseph L. "Progress Above Expectation in the Fundamental Subjects at a School for Mexican Children," Educational Research Bulletin (Los Angeles City Schools), VI (December, 1926), 10-13, 15.

Describes the steps taken to improve the achievement of Mexican children in the fundamental subjects and the progress above expectation made during seven months.

641
Mathews, C. O. The Grade Placement of Curriculum Materials in the Social Studies. Teachers College Contributions to Education, No. 241. New York: Teachers College, Columbia University, 1926. 152 pp.

Reports the results of studies of the comprehension of materials in the social studies by pupils in grades 4 to 12. Interprets findings in terms of grade placement of materials.

645
Moon, George R. "An Experiment Made by a History Teacher," School Review, XXXV (March, 1927), 208-16.

Reports the relative efficiency of intensive study and extensive reading in two high-school history classes.

646.
Moore, Nelle E. "An Analysis of Study Questions Found in Textbooks for the Intermediate Grades," Elementary School Journal, XXVII (November, 1926), 194-208.

Reports the percentage of memory and thought questions found in eighteen textbooks in reading, history, and geography used in grades 4, 5, and 6.

663
Smith, Hallie Lilburn. "The Rating of the Vocabulary of Six American History Textbooks for the Seventh and Eighth Grades." Unpublished Master's Thesis, Department of Education, University of Chicago, 1926.

Reports the results of studies of the vocabularies of six textbooks in American history to determine the general difficulty of the vocabulary of each book and the progressive difficulty within each.

July 1, 1925 to June 30, 1926

531
Good, Carter V. "An Experimental Study of the Merits of Extensive and Intensive Reading in the Social Sciences." Unpublished Doctor's Thesis, Department of Education, University of Chicago, 1925. Briefer Reports of the Study Appear in *School Review*, XXXIII (December, 1925), 755-70, and in *School and Society*, XXII (December 12, 1925), 758-60.

Presents the methods and results of an elaborate study among high-school and college students to determine the merits of several reading and study procedures.

535
Gray, Olive. "Teaching Pupils to Read Arithmetic and Other Subject Matter," *Elementary School Journal* XXVI (April, 1926), 607-18.

Emphasizes the importance of teaching pupils to read in content subjects and lists numerous words and expressions in various subjects which pupils should learn to recognize and interpret accurately.

540
Larsen, Laura Melana. "An Objective Method of Selecting Appropriate Geographical Readings for Fourth-Grade Pupils." Unpublished Master's Thesis, Department of Education, University of Chicago, 1925.

Reports the results of a study of the relative merits of three methods of determining the reading difficulty of supplementary books in geography.

542
Livingston, Ralph. "The Interrelations of the Vocabularies in Public-School Subjects," *Educational Research Bulletin* (Ohio State University), V (May 12, 1926), 208-13.

Reports the results of a comparison of the Pressey technical vocabularies in public-school subjects and the Thorndike Word List. Shows overlappings in Pressey's various lists.

547
Moore, Nelle Elizabeth. "An Analysis of Study Questions Found in Textbooks for the Intermediate Grades." Unpublished Master's Thesis, Department of Education, University of Chicago, 1925.

Presents the results of an analysis of study questions and suggestions found in eighteen texts in reading, history, and geography used in grades 4, 5, and 6.

July 1, 1924 to June 30, 1925

460
Gatto, Frank M. "Motivation of Historical Reading." Unpublished Master's Thesis, University of Pittsburgh, 1925.

Presents the results of an experiment among 277 eighth-grade pupils to determine the effect that two methods of motivating the reading of history have on comprehension.

487
Pressey, Luella Cole. "The Determination of the Technical Vocabulary of the School Subjects," School and Society, XX (July 19, 1924), 91-96.

Reports the results of studies of the technical vocabularies of school subjects. Emphasizes the importance of giving specific attention in teaching to vocabulary problems.

505
Ward, Jesse L., and Stevenson, P. R. "The Vocabulary of a History Text," American School Board Journal, LXXI (July, 1925), 65.

Presents the results of a study of the vocabulary of the first 106 pages of a history text for use in the seventh grade.

July 1, 1900 to June 30, 1924

224
Koch, Hazel E. "The Value of Books Recommended for High-School Students in Widening the Geographical Horizon," School Review, XXX (March, 1922), 193-98.

Shows the extent to which books recommended in English widen the geographical horizon of high-school pupils.

305
Pressey, Luella C. "An Investivation of the Technical Vocabularies of the School Subjects," Educational Research Bulletin, III (April, 1924), 182-85.

Reports the results of tabular studies of the vocabularies of various school subjects.

310
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